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FLATHEAD LAKE STATE PARK

WILD HORSE ISLAND

MANAGEMENT PLAN UPDATE

1994

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TABLE OF CONTENTS

PART I PAGE

Introduction 1

Legislative History 1
Management Goals 1
Primitive Parks Bill 2
Identified Issues ans Concerns 2

PART II

Interim Management Action 5
Alternatives 6
  Visitation Issues 6
  Wildlife Issues 8
  Vegetation Issues 9
  Facilities & Improvements Issues 11
  Concession Issue 12
  Park Administration Issues 13

PART III

Summary 15
  Proposed Action Timeline 16

APPENDICES Page

A. Primitive Parks Bill (H.B. 314) 17
B. WHI Advisory Committee Members 20
C. Zone Management & Limits of Acceptable Change (LAC) 21
D. Proposed Actions Environmental Assessment 31
E. WHI Teacher's Packet 65
F. Living With Bald Eagles 71
G. 1991 WHI Silene Spaldingii Progress Report 75
H. Pine Disease and Pine Beetle Report 80
I. 1993 WHI Noxious Weed Status Report 99
J. 1989 Draft WHI Fire Management Plan 112
K. Sample Request For Proposal (Hiking Concession) 119
L. Management Strategy Matrix 125
M. Draft WHI Brochure 139

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FLATHEAD LAKE STATE PARK

WILD HORSE ISLAND MANAGEMENT PLAN UPDATE 1994

Part 1: Introduction

Wild Horse Island became a State Park in 1978. Under the Administrative Rules of Montana, a state park is defined as, "an area providing high quality recreation opportunities distinctive and suitable enough to attract people on a state, regional and national basis. " The A.R.M. rules further state, "that management will be directed toward retention of state parks in as near a natural condition as possible without impairment of ecological features and values."

The original plan for Wild Horse Island was developed in 1978. As part of effective planning , it is necessary to conduct periodic review and evaluation of management practices as they apply to current situations. This review process occurs at periodic intervals. The last review was carried out in 1986 when a Wild Horse Island Advisory Committee was formed and met to discuss issues and management actions for the island. In 1987, a planning update document was prepared based on committee recommendations. The current update process is a continuation of the review procedure.

Upon committee advisement, a specific management philosophy for the island was adopted in 1987. This states as follows:

MANAGEMENT PHILOSOPHY

"Wild Horse Island's natural qualities should be emphasized and conserved. The palouse prairie and Douglas fir/Ponderosa pine forest ecosystems, rare plants and present wildlife species should be preserved, and primitive dispersed public recreation should be provided."

In keeping with the A.R.M. rule definition and the management philosophy, the following management goals have been established.

MANAGEMENT GOALS

1. To preserve and to the greatest extent possible, restore the natural ecological processes and conditions that exist on the island.

2. To provide an educational experience which allows the public an opportunity to understand and appreciate the unique natural and historical features of the island and which stimulates interest in ecological principles.

3. To provide a range of compatible dispersed recreational opportunities, while maintaining the primitive character of the island.

In the spring of 1993, the Montana legislature passed the Primitive Parks Bill (Appendix A.). Wild Horse Island has been designated as a primitive park. This legislation limits development to the extent that facility construction must fall within those guidelines allowed by the legislation. The effect on Wild Horse Island is such that the only development the updated management plan can consider is the improvements necessary to meet minimum public health requirements in the matter of sanitation, the establishment of hiking trails, the improvement of existing trails, and minimal signage. Beyond this, all other facility considerations for the future would be prohibited by legislation. Furthermore, this bill exempts Montana residents from payment of park entry fees.

In June of 1993, the Wild Horse Island Advisory Committee was re-established. Members were selected to represent the diversity of interests associated with the island (Appendix B). The committee met to discuss issues of concern. The following issues were identified:

1) **Visitation**

a) wildlife
- affecting movements
- reproduction
- poaching
- harassment
- nest abandonment (eagles, osprey, geese)

b) vegetation
- loss from trampling
- spread of exotic plants
- endangered specie

c) soils
- compaction
- erosion

d) aesthetics (crowding factor)
- # of parties seen
- size of groups

2) Wildlife Management

- Bighorn sheep, deer and wild horse populations
- Bald Eagle nesting habitat

3) Vegetation Management

- forest incursion on palouse prairie
- fire control
- tree diseases and pine beetle infestations
- exotic vegetation and noxious weed control

4) Public Facilities and Improvements

- marked hiking trails
- public boat dock
- vault toilets
- signing
- interpretive displays

e) historic sites
  - vandalism
  - preservation

f) private property
  - use of docks
  - vandalism

5) Commercial Ventures

- guided hiking tours
- boat shuttle service
- canoe/ hiking service
- horseback tours
- mountain bike tours

6) Park Administration
- land acquisition
- park security and special regulations
- visitor management

Since 1987, little or no data has been collected on visitation or direct human impacts to wildlife and vegetation. In addition, no recent inventories have been done which would indicate the effects of wildlife on range conditions or the status of other ecosystems. As adequate current data is not available for analysis or comparison to earlier studies or 1980's figures, the problem of updating the management plan becomes two-fold. First, the update process will need to address known problems and develop interim management actions for up to three years until sufficient data is available for analysis and comparison purposes. Secondly, there exists a need to establish a long term monitoring system reflecting a management zoning approach and the "Limits of Acceptable Change" (LAC) concept (Appendix C).

As mentioned in the management philosophy, providing for primitive dispersed recreation is a major goal. The impacts from dispersed recreation are a vital concern because they effect almost all of the physical and social attributes of Wild Horse Island and its functioning as a park. Since, useful data on this subject has not been collected for the past five years and previous data has questionable statistical validity, it is necessary that management proceed cautiously with any proposed changes in current practices and is conservative in its implementation.

One underlying point common to all recreation management, whether a primitive or developed area, is that recreationists are very diverse. It is not appropriate to think of or try to manage for the stereotypical or average recreationist. This is analogous to trying to manage the average fishery or average state park. Because recreationists are so diverse, we should work at providing a variety of recreation opportunities that accommodate the different needs, motivations and behavior of visitors. In addition, we have the problem of "quality experiences". Many managers work hard to provide them. However, the concept of quality is highly personal and subjective. What is quality for one individual is not quality for another. What we generally end up with is a particular manager's perception of quality and managerial actions that promote this view. These

latter approaches tend to cause displacement of recreationists from certain areas as the activities or the setting changes because of actions such as increased facilities, controls, or lack of such. The question then becomes how are we to effectively manage Wild Horse Island for recreation? The important point to remember when trying to answer this question is that the users are in charge of their recreational experience. They try to satisfy their particular needs and perception of quality by choosing recreational opportunities and preparing for them prior to actual participation. Obviously, they do not always obtain their objective. Sometimes weather factors can ruin a good time, or perhaps the facilities don't meet their expectations (either not enough or too much). Our goal is not to provide satisfying experiences, but rather the opportunity for the visitor to achieve a satisfying experience through an activity or a setting. Since we can not provide everything for everybody, we must concentrate on the particular opportunities that the park can provide. These opportunities will encompass various standards for facilities or settings wherein the individual might find the experience they seek. The greater the number of opportunities available, the greater the likelihood an individual has of matching their preferences and expectations with what is available. At face value this approach can cause some serious problems. Often we try to manage for every ones interest and end up satisfying no one. Therefore, we must be careful that we do not cause unnecessary conflicts among users. This goal can usually be obtained by careful analysis of the park's attributes and managing areas for the particular opportunities that are most conducive to these attributes. This in turn allows the visitor a better chance to obtain a satisfying or "quality" experience.

The management of dispersed recreation is a much more complex task than at first glance. Because of the diversity of areas found on Wild Horse Island, it can not be managed uniformly. Such factors as proximity to private property, topography and ecosystems, scenic beauty, presence of historic sites and endangered plant and wildlife species all contribute to the areas uniqueness. How well the area endures use will vary from site to site. In addition, the recreational opportunities afforded may vary from site to site. Although some management actions may be carried out for the entire island, many will apply only to a specific area (e.g. restricting access to certain areas near endangered species).

The management strategies for mitigating recreational impacts falls into three basic categories. These are: 1) modify behavior 2) modify the site, and 3) modify use. Modification of behavior involves changing the visitors mannerisms or attitude about the resource, so that a low impact backcountry type ethic of resource preservation and appreciation is instilled in the minds of the

visitor. This is accomplished primarily through informational/interpretive practices or through regulation and enforcement when other means fail. Modification of site involves facility removal or installation, site hardening, rehabilitation of over used sites or any other method which physically affects an area. Modification of use involves limitations on types of use, closures and special regulations which affect what activities may be allowed. The alternatives developed for mitigating impacts of recreation use were developed with these strategies in mind.

Part II: Interim Management Actions

The following section addresses management options which have been developed for the various identified issues relating to Wild Horse Island, which may realistically be addressed in the next one-three years. Although measurable data is not always available, it is not a prerequisite to solving known problems in the interim. At some point, it becomes necessary to develop a solution to an unacceptable or potential problem and take action even if all the data is not in hand. Flexibility in problem solving is essential in the long term. If a solution is not working or a better idea develops later, then current actions will be re-evaluated.

There are generally many alternative means of dealing with a specific issue. In most cases a combination of approaches is likely to be most successful. Each issue has a preferred alternative(s) marked by an asterisk (*), that was chosen based upon which best met the management philosophy and objectives established for Wild Horse Island and could be implemented in the given time frame. An environmental assessment (Appendix D) discusses the proposed alternatives and their effects in more detail. One should note that the alternative "no action" is a viable alternative which may be chosen in some instances. The selected management actions would be followed until such time as further data is available for analysis to determine if changes are necessary in management approaches.

Visitation

Current Situation

At present, annual visitation is not well known. Using 1987 data as the base point with 4% annual increase, this translates into a 1993 visitation estimate of approximately 4500 persons. It is not unreasonable to anticipate the number of visitors increasing in the future as tourism in the Flathead Valley expands.

The increase since 1987 has resulted in some visible impacts to vegetation, especially at Skeeko Bay, which has traditionally been the most popular public access. Some widening and development of multiple trails has occurred along the path leading to the homestead from Skeeko Bay and the landing area has suffered vegetation loss and bare soil increase. Concerns have arisen over requests for access to the island by larger groups.

Populations of the rare plant species Silene spaldingii is on the decline and impacts due to human disturbance may effect its' ability to survive.

Use of private docks by the public result in trespass situations and increased potential for theft and vandalism to cabins. Currently, no public docks exist and present legislation prohibits such a facility.

Although Wild Horse Island has vast opportunities for environmental education, to date little has been done to formally utilize this potential. There is no program available to schools, recognized organizations or the general public which emphasizes the natural features of the island for interpretive purposes.

Human disturbance to various wildlife species, especially the bald eagle, is potentially high.

Alternatives

***1. Establish preferred public access landing areas for boats** (Zone Map, Appendix C.). Although visitors would not be required to land exclusively at these sites, emphasis of these areas for access would be pursued through maps, brochures, news releases and field contacts. These areas would be viewed as trailheads allowing access to the island interior. At each access point would be placed a 4' x 4' bulletin board with pertinent information regarding the park's topography, history, wildlife, regulations and other interpretive type text. Also, visitor registration boxes would be placed near these areas to begin a data collection effort. A main trail leading from the landing area to the interior could be established a length of 100 -200 feet and then dissipate to where visitors would then disperse on their own (exception of Skeeko Bay with loop nature trail). Although some loss of vegetation may occur at these sites, impacts would be confined.

Justification

By establishing preferred landing sites the majority of the visitors will be directed away from ecologically sensitive areas and private property. Through signing at these locations, more visitors

will have an opportunity to obtain information about the island and it's features. Improving awareness of alternative access points may reduce the visitation pressure at Skeeko Bay. In addition, effective data collection through self-registration would be possible.

***2. Develop informational/interpretive brochures to be made available** at public access points and at local commercial businesses which emphasize educational/natural experiences or opportunities available on Wild Horse Island. These brochures would attempt to not only inform visitors, but to spark interest and cultivate appreciation and understanding of natural processes.

Justification

Brochures are an effective way to reach a large number of visitors. A properly informed visitor is more likely to obtain a quality experience as they are better able to match their preferences with the available recreational opportunities. Educational opportunities are provided through use of brochures, which make visitors more informed and aware of their role in protecting the resource.

***3. Establish a teacher's packet** (Appendix E.) targeting grades 5-7, which would provide an assortment of ideas and activities for teachers who are planning to introduce their students to the natural environment through a visit to Wild Horse Island. The Parks Division would provide transportation to the island for two, one day outings, each spring and fall. If private transportation can be obtained, the packet would allow teacher's to visit the island anytime their schedules permit and not necessitate a guided tour by park staff.

Justification

A teacher's packet will provide educators with a specific guide to Wild Horse Island's attributes allowing them to better prepare for and conduct field trips.

***4. Limit group size to 12 persons without a special permit** and a maximum of 30 with a permit. This would allow more control over group activities which tend to create more impact. Currently the group size limit is 30 without a permit and no maximum limit.

Justification

Large groups can cause more environmental damage and also may be a source of conflict for other user groups. Resource damage and visitor conflicts may be reduced by placing a smaller limit on party size.

5. No Action

Wildlife

Current Situation

The original management plan called for a bighorn sheep population of 50-75 animals. The population range for bighorn sheep was subsequently increased to 75-100 by agreement of the planning task force that developed the 1985 plan. The estimated large mammal population at present is 300 bighorn sheep, 100 mule deer and five wild horses. This has resulted in some areas of the island being overgrazed, especially the higher knoll areas preferred by the sheep. Current estimate is that conditions on the island can support up to 150 sheep, 75 mule deer and 5 wild horses.

There presently exists an active bald eagle nest near Skeeko Bay, the area which is the most popular public access point. Skeeko Bay is the only natural bay around the island and traditionally is used for overnight mooring and as a landing site and walk-in point for day use visitors. The immediate vicinity serves as a critical foraging area for both the adult eagles during the nesting period and the newly-fledged young each year. Human disturbance of the nesting area during critical periods may result in abandonment of the nest. Reasonable efforts need to be made to prevent such an occurrence (Appendix F.).

Condition of other wildlife appears to be good with no immediate need for action.

Alternatives

***1. Remove 100-150 bighorn sheep and 25 mule deer** from the island to reduce current herd size to previously established levels. Maintain 2-5 wild horses.
Justification
Removal of excess bighorn sheep and mule deer above limits established in the management plan will improve range conditions and promote healthier populations of these species. The wild horses have little overall impact on available range forage. Their presence helps to maintain the historic character of the island.

***2. Provide temporary closure of area within 3/8 mile of Bald Eagles nest.**
Closure would cover time period when nesting eagles are most sensitive to human disturbance. Recommend 3/15 to 7/30. Closure may be regulatory or voluntary.

Justification

Bald eagle sensitivity to human disturbance varies between seasons. They are particularly sensitive during the nesting period (incubation, early fledgling stage). Impacts from hikers may lead to abandonment of the nest and surrounding territory.

3. Allow limited hunting by special permit for Bighorn Sheep and Mule Deer.

4. No action.

Vegetation

Current Situation

The native palouse prairie is being encroached upon by Ponderosa pine seedlings resulting in a loss of total range and replacement of native grasses by other plant species.

Open Ponderosa pine stands are being invaded by Douglas fir regeneration on the easterly and northerly aspects of the island.

Increases in bighorn sheep and mule deer populations has caused soil disturbances and overgrazed conditions on some areas of the prairie.

The palouse prairie has built up a substantial depth of ground litter at many sites due to fire suppression, contributing to a reduction of both in the endangered plant Silene spaldingii and an increase in ground fuels (Appendix G).

Some ponderosa pine have suffered pine beetle infestation with resulting beetle kill. A needle disease, Diplodea pinea has infected trees in the southeastern quarter of the island (Appendix H.).

Small isolated outbreaks of knapweed have occurred at various locations. Leafy Spurge which was present and chemically treated in 1987, was not located during a recent survey, but could still be present. Canada Thistle has established itself in small pockets throughout the island. It is especially adapted to some of the low lying wet areas where eradication would be difficult (Appendix I).

Traditionally, there has been a policy of total suppression of all fires on Wild Horse Island. This intervention of man has altered the natural processes that have historically occurred on the island. The prairie areas rely on periodic fire to remove ground litter and supply nutrients for native

grasses. Fire has always been a part of the natural process for the forest as well. Suppression has resulted in a build up of ground fuels and intrusion of prairie areas by Ponderosa pine and open park areas by Douglas fir. Past attempts to implement controlled burning as a management tool was met with strong public opposition and was never implemented (Appendix J.).

Alternatives

***1. Total eradication through mechanical and chemical means of all known knapweed and leafy spurge infestations.** Begin chemical spraying for control purposes of areas of Canada Thistle.

Justification

Knapweed and leafy spurge are very aggressive plant species. If allowed to gain a foothold they will soon displace native plants. Canada Thistle is a disturbance weed and will outcompete native species in areas where for which it is well adapted. Though not as critical a problem as the former two noxious weeds, it is a non-native species and considered an intruder in the natural ecosystem.

***2. Implement controlled burning of a selected grassland area** as outlined in the 1989 Draft Fire Mgmt. Plan.

Justification

Selective controlled burning would return the palouse prairie to a more natural condition. This would be a pilot program to determine controlled burning feasibility and success.

***3. Begin mechanical control (cutting) of small Ponderosa Pines which are encroaching on the Palouse Prairie.** Start in homestead area and on the island's east side.

Justification

Even if controlled burns are determined to be feasible and occur in the future, there are a significant number of trees large enough not to be effected by the burn and areas where controlled burns would not be conducted.

***4. Seasonal closure to the public of areas where the endangered plant specie Silene spaldingii is known to be located,** unless part of an authorized hiking tour.

Justification

Seasonal closure of small confined areas would prevent loss of this rare species through accidental trampling by visitors. If the species numbers rise and it disperses to other locations on the island where there is reasonable assurance of its survival, then this action would be re-evaluated.

5. Chemically treat or cut and remove pines which are infested with beetle or blight.

6. No action

Facilities and Improvements

Current Situation

At present there are no marked trails on the island. All trails currently used by visitors are game trails. These trails often disappear or can lead to ecologically sensitive areas or private property. In some locations multiple parallel trails have developed. Many visitors do not know where to go on the island or what to look for when they get there.

There is currently one vault toilet on the island for public use. Unfortunately, it is at a location that is difficult to find and thus infrequently visited.

Buildings and related structures dating back to the early 1900s still exist today and have an important role in the history of Wild Horse Island. However, these structures need to be preserved if they are going to play a part in any future interpretive program for the park.

Signing on the island is virtually non-existent which results in confusion for some visitors. Lack of signing includes maps, interpretive or other informational efforts.

Safety of the visitor is a major concern of management. As a result of past ranching activities, there exists a significant amount of barb wire lying on the ground in many areas of the island. This presents a hazard to the visitor and is a visual eyesore.

The effect of recently passed Primitive Parks Legislation restricts extent of future facility development (Appendix A.).

Alternatives

***1. Construct where necessary or mark a self-guided nature/interpretive trail.** Starting at Skeeko Bay access point the trail would wind up to the Johnson Homestead and then loop around the orchard area and nearby drainages for about 1/2 mile returning to the homestead. The entire trail would have approximately 12 stations and would be about 3/4 of a mile in length. The maximum width would be 18" with natural surfaces. Approximately 75% of the trail would utilize existing game trails. This would provide an opportunity for education and discovery for those

visitors who either do not desire to or are incapable of hiking the island. Interpretive signing explaining the era and the historical significance of the homestead would be placed near the buildings along the trail. (also refer to alternative #1 under visitation). A brochure would be developed which explains the features to be noted at the various stations.

Justification

The area of the proposed trail is already the most popular . A designated trail would reduce the development of undesired multiple trails currently found in this area. Although not required to stay on the trail, many visitors would do so. By confining trampling to one tread resource impacts in the long run will be reduced. The added benefit of the use of the trail for educational purposes would serve to increase the recreational opportunities for visitors through learning experiences, with no or little additional impact to the resource.

2. Sanitation facility (pit type toilet) to be placed about halfway between Skeeko Bay Trailhead and the Johnson Homestead.

***3. Stabilize/preserve the Homestead site and other historical structures.**

Justification

Most of the historic buildings found on the island are in an advanced state of deterioration. To ensure that these structures are not lost for future generations to enjoy and experience, it is necessary to stabilize these structures before they collapse.

***4. Remove remaining barbwire fencing.**

Justification

The barbwire fencing is a result of past ranching activities prior to Wild Horse Island becoming a state park. The presence of this material creates a potential hazard for visitors and also for wildlife. In addition, it diminishes the aesthetic quality of the area.

5. No action.

Commercial Concession

Current Situation

At present there is no commercial concession activity on Wild Horse Island. An attempt was made in 1986 to provide guided hiking tours on the island, but this venture fell through and has not been attempted by anyone else since. In the last year, several parties have expressed an interest

in providing some type of guided service to patrons utilizing Wild Horse Island. These have varied from simple guided hikes to horseback riding and mountain bike excursions.

Alternatives

1. Authorize one hiking concession on a limited basis. The concession would allow for guided hikes of up to ten persons, once per day, three days a week from 6/1 to 9/1. No weekends. Concessionaire would have to follow strict guidelines set out by the Department (Appendix K.).

2. Resume shuttle service by State Parks personnel out of Big Arm State Park.

3. Contract out shuttle service (strictly to and from island, no guiding), limiting the number of persons to a maximum of 20 per day, three days per week.

***4. No action**

Justification

Wild Horse Island has been designated by law as a primitive park. It has been determined that commercial concessions do not meet the intent or spirit of this legislation regardless of the size or impact of the operation.

Park Administration

Current Situation

Of the 56 private lots located on the island 27 have been developed. A few of the remaining lots are located in areas which may influence park operations, historic sites and future management options. These lots are primarily located on the west side of the island near Sunset Point and on the north side of the island near Skeeko Bay (Zone Map, Appendix C).

If impacts to the island are to be held in check then certain controls must be placed on visitation. These may take the form of direct (e.g. regulations) or indirect controls (e.g. signing, brochures). If visitation increases as expected in the years ahead it is important to have control mechanisms in place. Currently, there are no control mechanisms in place other than regulations. Visitors are free to roam the island wherever they wish (except private property). This may have an affect in the future on endangered species and for other visitor related impacts.

The seasonal park ranger position for Wild Horse Island has been cut due to reductions in budget. In the past, this person patrolled the island 2-5 hours a day, 3-5 days per week. Their duties included, providing information, assisting the visitor, gaining compliance of regulations, data collection and routine security for the area. The local game warden occasionally patrols the island, although not on a regular schedule. The burden of security and enforcement of park and wildlife laws and regulations now rests with the game warden.

Alternatives

***1. Re-establish Wild Horse Island seasonal park ranger position.**

Justification

In order to effectively manage Wild Horse Island it is vital to have someone onsite to carry out many of the necessary tasks.

2. Increase number of patrols of island by game warden.

***3. Purchase selected private lots.**

Justification

If funding becomes available, the purchase of selected lots in critical locations would help ensure protection of sensitive wildlife species, stabilization of historic structures and reduce potential for private owners vs public user conflicts.

***4. Implement zone management** (Appendix C) to prepare for anticipated increases in visitation and to maintain the character of the park.

Justification

Wild Horse Island is a unique unit in the state park system in that it is relatively undeveloped. It contains a diversity of resources and conditions and the potential for a wide array of recreational opportunities. How well it will endure use will vary from site to site. Through zoning and setting of different standards for acceptable impacts in different zones, a staircase approach to resource protection is attained. Portions of Wild Horse Island will be maintained in such a way that the quality of the conditions found will not fall below standards established for each zone. Since the definition of primitive experience differs from person to person, it is felt this approach will protect the resource values that remain on the island, while allowing for a variety of "quality experiences".

5. No action

Part III: Summary

This planning update is a continuation of the process initiated in 1978 when Wild Horse Island became a State Park. Within this document an attempt has been made to resolve the current issues and concerns about the management of the island and to anticipate future problems. Wild Horse Island is located in an area marked by increasing tourism and growth of permanent population. These trends and their consequences are a major concern of the Department of Fish, Wildlife and Parks. To maintain the park in as natural a condition as possible will require decisions which will not always be popular. Efforts have been made to strike a balance between the primitive type conditions as they currently exist on the island and provisions for recreational opportunities. The management direction presented here, reflects the diversity of the island's resources and focuses on the maintenance of its' ecological systems.

The issues, concerns and approaches covered in this management update lead to a basic conclusion, that ecosystems are complex systems that are easily altered by the intrusion of human elements. The present components and characteristics of primitive areas similar to Wild Horse Island evolved in the near total absence of man, and therefore it is not surprising that in today's world, man's presence can have a devastating effect on the ecological balance if not properly controlled. This is very evident on Wild Horse Island with many of the current ecological problems reflecting the human related practices that have occurred over the years. Wild Horse Island is no longer in a pristine condition and in all likelihood will never be again. Previous uses including horse and cattle ranching, introduction of non-indigenous species and current cabin development have left their mark. Although we must accept these changes and their effects, there remains areas of great natural beauty and efforts must be made to protect them. Wild Horse Island is not a wildlife refuge. It is a state park meant to be open to the public so that visitors have a chance to appreciate it. Park management walks a fine line between recreation and resource protection, especially in this case. Any amount of use will bring some change to the environment. Controlling that use through proper active management in order to keep the amount of change at an acceptable level, and at the same time provide opportunities for satisfying recreational experiences at Wild Horse Island, is the challenge we presently face and will continue to face in the future.

Table 1. Implementation Timeline forProposed Actions

	1994												1995												1996											
Proposed Action	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
SHEEP/DEER TRANSPLANT	*	*																						*	*											
WEED CONTROL					*	*											*	*											*	*						
WIRE/FENCING REMOVAL										*																										
CUT ENCROACHING PINES																*												*								
ZONING						*																														
ESTABLISH LANDING SITES																		*																		
NATURE TRAIL																				*																
BROCHURES/TEACHER'S PACKET						*																														
GROUP SIZE LIMITS						*																														
CONTROLLED BURN																						*														
PURCHASE SELECTED LOTS																																				*
STABILIZE HISTORIC BLDGS.									*																											
RANGER POSITION					*																															

The above timeline represents completion dates of the proposed actions. Some actions will necessitate annual, periodic or phased implementation.

APPENDICES

4

HOUSE BILL NO. 314

INTRODUCED BY RANEY, FRITZ, WATHE, RYE, RYAN, HARPER, ECK,
SIMON, FELAND, SCHWINDEN, GILBERT, WANZENRIED, WILSON,
MCCULLOCH, KNOX, MASON, KADAS, FRANKLIN, SCHYE, STRIZICH,
TOOLE, BROOKE, MCCAFFREE, SQUIRES, DOWELL, GRINDE, EDDY,
RUSSELL, MENAHAN, DOLEZAL, DRISCOLL, SWANSON, HIBBARD,
BRANDEWIE, GAGE, FAGG, BECK, HYATT, DOHERTY, BIRD,
DAILY, BIANCHI, PECK, WELDON, CHRISTIAENS, COBB,
GROSFIELD, YELLOWTAIL, LYNCH, WATERMAN, HARP, BURNETT,
ZOOK, GERVAIS, BARTLETT, MERCER, J. RICE, ELLIOTT,
REAM, TUSS, HANSEN

A BILL FOR AN ACT ENTITLED: "AN ACT DESIGNATING AND ESTABLISHING CERTAIN MONTANA STATE PARKS AS PRIMITIVE PARKS; LIMITING DEVELOPMENT IN PRIMITIVE PARKS; AND ELIMINATING USER FEES FOR MONTANA RESIDENTS WHO VISIT PRIMITIVE PARKS; ~~ESTABLISHING A PENALTY FOR NONRESIDENTS WHO USE PRIMITIVE PARKS WITHOUT PAYING THE USER FEE; AND AMENDING SECTION 23-1-106, MCA~~."

WHEREAS, certain Montana state parks still retain the unique, primarily undeveloped character for which they were originally acquired; and

WHEREAS, there is an abundance of other state and federal land that has been developed beyond its primitive

---

LParker
Adm. & Fin.
Con. Ed.
Enf.
Fld. Serv.

condition and that is readily available to the recreating public; and

WHEREAS, there are also numerous well-developed private sector recreational opportunities in Montana; and

WHEREAS, Montana should provide a variety of recreational opportunities for its residents; and

WHEREAS, Montana residents have the right to use primarily undeveloped state parks without regard to their ability to pay; and

WHEREAS, budget constraints militate against further improvement of Montana's primarily undeveloped state parks.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

NEW SECTION. **Section 1.** Short title. [Sections 1 through 4] may be cited as the "Montana Primitive Parks Act".

NEW SECTION. **Section 2.** Primitive parks established. Because of their unique and primarily undeveloped character, the following state parks and management areas are designated as primitive parks and are subject to the provisions of [sections 1 through 4]:

~~(1) West Shore (Flathead Lake) state park;~~

~~(2)~~(1) Lambeth (Lake Mary Ronan) state park;

~~(3) Logan state park;~~

~~(4)~~~~(3)~~(2) Thompson Falls state park;

(5)(4)(3) Wild Horse Island state park;

(6)(5) Frenchtown-Pond-state-park;

(7)(6)(4) Lost Creek state park;

(8)(7)(5) Painted Rocks state park;

(9)(8)(6) Ackley Lake state park;

(10)(9)(7) sluice boxes state park;

(11)(10)(8) Deadman's basin state park;

(12)(11) Tongue-River-reservoir-state-park;

(13)(12)(9) Pirogue Island state park;

(14)(13)(10) Medicine Rocks state park; AND

(15)(14)(11) Headwaters state park;.

(12) COUNCIL GROVE STATE PARK;

(13) BEAVERHEAD ROCK STATE PARK;

(14) NATURAL BRIDGE STATE PARK; AND

(15) MADISON BUFFALO JUMP STATE PARK

(16)-south-end-of--Canyon--Ferry--reservoir--(management area);-and

(17)-Thompson-Chain-of-Lakes-state-park.

NEW SECTION. **Section 3.** Limit on development of primitive parks. (1) As of [the effective date of this act], the only development allowed in primitive parks designated in [section 2] is:

(a) necessary improvements required to meet minimum public health standards regarding sanitation, which may include necessary ACCESS TO outhouses, vaults, and water;

(b) improvements necessary to ensure the safe public use of existing boat ramps;

(c) addition of gravel to existing unpaved roads and the resurfacing of paved roads when necessary to ensure safe public access;

(d) establishment of new hiking trails or improvement of existing hiking trails; and

(e) installation of minimal signage indicating that the park is a designated primitive park in which development has been limited and encouraging the public to help in maintaining the park's primitive character by packing out trash.

(2) The following development of designated primitive parks is prohibited:

(a) installation of electric lines or facilities, except when necessary to comply with subsection (1)(a);

(b) installation of recreational vehicle sanitary dumpsites where they do not presently exist; and

(c) creation of new roads and paving of existing but previously unpaved roads.

NEW SECTION. **Section 4.** Elimination of resident user fee -- fee for nonresident use -- penalty. (1) In recognition of the right of Montana residents to use primitive parks without regard to their ability to pay, a Montana resident is not required to pay a user fee for the

use of any primitive park designated in [section 2], EXCEPT THAT THE DEPARTMENT MAY CHARGE CAMPING FEES AT THOMPSON FALLS STATE PARK AND HEADWATERS STATE PARK.

(2) A nonresident who wishes to use a primitive park is required to pay the state park user fees chargeable under 23-1-105 ~~and is subject to the penalty set out in 23-1-106(3) for failure to pay applicable fees and charges~~.

~~Section 5. Section 23-1-106, MCA, is amended to read:~~

~~"23-1-106. Rules -- penalties -- enforcement. (1) The department may make rules governing the use, occupancy, and protection of the lands and property under its control.~~

~~(2) Any person who injures or damages any land or property under control of the department or any private property thereon on the land or therein the property or who violates any of the rules made by the department relating to those areas is guilty of a misdemeanor and shall be fined not more than $500 or be imprisoned in the county jail for not more than 6 months.~~

~~(3) A nonresident who uses or attempts to use a primitive park designated in [section 2] without payment of the user fee authorized in 23-1-105 is subject to payment of an administrative civil penalty of $100 for each incident of unauthorized use.~~

~~(4) It is unlawful and a misdemeanor punishable as provided in subsection (2) to refuse to exhibit for~~

~~inspection any park permit, proof of age, or proof of residency upon request by a fish and game warden, park ranger, or peace officer.~~

~~(4)(5) The department shall enforce the provisions of this chapter and rules implementing this chapter. The director of the department shall employ all necessary and qualified personnel for enforcement purposes.~~

~~(5)(6) The department is a criminal justice agency for the purpose of obtaining the technical assistance and support services provided by the board of crime control under the provisions of 44-4-301. Authorized officers of the department are granted peace officer status with the powers:~~

~~(a) of search, seizure, and arrest;~~

~~(b) to investigate activities in this state regulated by this chapter and rules of the department and the fish, wildlife, and parks commission; and~~

~~(c) to report violations to the county attorney of the county in which they occur."~~

NEW SECTION. **Section 5.** Codification instruction. [Sections 1 through 4] are intended to be codified as an integral part of Title 23, chapter 1, part 1, and the provisions of Title 23, chapter 1, part 1, apply to [sections 1 through 4].

-End-

WILD HORSE ISLAND ADVISORY COMMITTEE

Mr. Richard Kuhl
Flathead Wildlife Inc.
P. O. Box 4
867 N. Main
Kalispell, MT 59901

Mr. John Cramer
Polson Outdoors
391 La Belle Lane
Polson, MT 59860

Ms. Marilyn Wood
The Nature Conservancy
343 First Avenue West
Kalispell, MT 59901

Ms. Phyllis Fulkerson
Polson Chamber of Commerce
P. O. Box 677
Polson, MT 59860

Mr. Mike Hutchin
Lake County Commissioners
Lake County Courthouse
Polson, MT 59860

Ms. Beverly O'Brien
Department of State Lands
P. O. Box 490/2250 Hwy 93
Kalispell, MT 59901

Mr. Pete Talbot
WHI Cabin Owners
1501 Dickinson
Missoula, MT 59802

Mr. Steve McCool
University of Montana
Forestry School
Missoula, MT 59812

Mr. Brent Mitchell
Flathead Audubon
P. O. Box 715
Bigfork, MT 59911

Mr. Tom McDonald
CS&KT
P. O. Box 278
Pablo, MT 59855

Mr. Dana Dolson
DFWP
Department Sociologist
Helena, MT 59620

APPENDIX C

Zone Management and Limits of Acceptable Change (LAC)

Because of the diversity of resources, uses and conditions, few areas can be managed uniformly. How well an area endures use will vary from site to site. In addition, most visitors differ in their definitions of what constitutes a quality experience. Management approaches that work in one area may not be very effective in others. Zoning is a method that recognizes these differences. It attempts to segment a given area according to its' resource attributes and utilize different strategies to protect the resource while maximizing recreational opportunities as a whole. It requires different standards, use levels and activities to be applied to the various segments so that the natural character of the entire area is not lost.

The zone management and LAC process developed for Wild Horse Island (Figure 1.) will be based on the concept that originally had been initiated for Wild Horse Island in 1987, but was not fully implemented. Zone management is an approach that will be applied to all state parks in Region 1 for purposes of management consistency. Those zones described for Wild Horse Island may also be applied at other areas as well (Table 1.).

LAC Overview (condensed from Stankey et al., 1985)
The basic premise of the LAC concept is that change is a natural inevitable consequence of recreation use. Both environmental and social changes are involved. The nature and extent of these changes will vary throughout an area because of differences in types and amount of use, susceptibility of vegetation and soils to use pressure and other factors. LAC directs its attention from use level as a key management concern to the environmental and social conditions desired in a particular setting. It focuses directly on managing for desired conditions, rather than on how recreation itself should be managed. Traditionally, the task of primitive area management was to define the level beyond which excessive impact would occur. The LAC framework with its emphasis on desired conditions, attempts to define what is acceptable change for a particular impact.

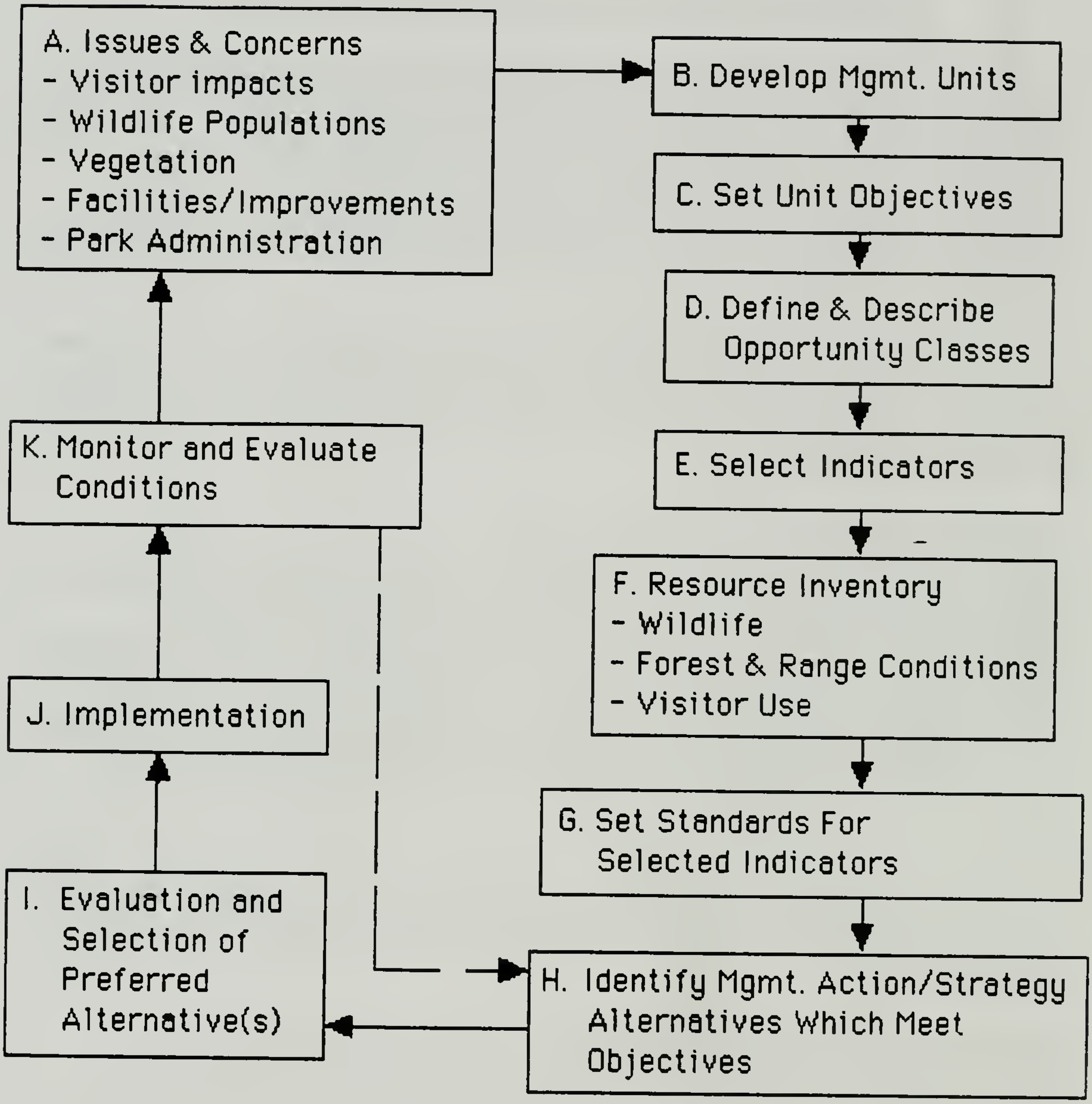
Impacts as a result of recreational use are inevitable because even light use causes some ecological change. These impacts affect nearly all aspects of the ecosystem, especially soils and vegetation , and are a contributing factor in determining the quality of a primitive experience and whether displacement occurs.

Zone management incorporates the LAC process by dividing an area into sub-units or compartments (Figure 2.), setting management objectives for these units, and defining and describing the recreation opportunity afforded in these units through a classification system. Within each compartment there are indicators and standards which can be used to maintain the objectives of the particular unit and the preferred setting. Finally, in order to maintain the standards for the unit, some type of monitoring system must be incorporated into the management of the unit. When the standards are approached, met or exceeded management actions to maintain acceptable levels of change will occur.

A. Purpose

To develop guidelines for management of primitive dispersed recreational use in order to maximize compatible recreational opportunities for the visitor, while maintaining a standard of

FIGURE 1. LIMITS OF ACCEPTABLE CHANGE PLANNING MODEL
WILD HORSE ISLAND, 1994


A. Issues & Concerns
- Visitor impacts
- Wildlife Populations
- Vegetation
- Facilities/Improvements
- Park Administration
B. Develop Mgmt. Units
C. Set Unit Objectives
D. Define & Describe Opportunity Classes
E. Select Indicators
F. Resource Inventory
- Wildlife
- Forest & Range Conditions
- Visitor Use
G. Set Standards For Selected Indicators
H. Identify Mgmt. Action/Strategy Alternatives Which Meet Objectives
I. Evaluation and Selection of Preferred Alternative(s)
J. Implementation
K. Monitor and Evaluate Conditions

(Adapted from Stankey et al, 1985)

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TABLE 1. OPPORTUNITY CLASS DESCRIPTIONS

RECREATIONAL OPPORTUNITY CLASS CHARACTERISTICS	Class 1 Special Resource Zone	Class 2 Natural	Class 3 Semi-Natural	Class 4 Semi-Natural Modified	Class 5 Semi-Natural Motorized	Class 6 Modified-Natural Motorized	Class 7 Modified-Rural MOTORIZED
Ecological Conditions	Unmodified	Unmodified	Semi-modified	Semi-modified	Modified	Modified	Highly Modified
Human Impacts	Not measurably affected, site recovers annually	Not measurably affected, site recovers annually	Confined impacts, visible from year to year	Confined impacts, visible from year to year	Barren core ground from 0 - 2000 feet. Visible from year to year	Barren core ground from 2,000 - 10,000 feet. Visible from year to year	Barren core ground above 10,000 feet. Visible from year to year
Interaction with other on site users	Rare, no group interaction	Rare, rare group interaction	Moderate, group interaction minimal	Moderate to high, group interaction likely during peak seasons	Low, group interaction minimal	Moderate, group interaction moderate	High, group interaction moderate
Interactions with off site uses	None	None	Noise	Noise and view	Noise	Noise and view	Noise and view
Opportunities for isolation and solitude	Moderate	High	Moderate	Low	Moderate	Low	None
Challenge	Low to High	High	Moderate	Low	Low	Low	Low
Response time to emergency	Slow	Slow	Moderate	Rapid	Moderate	Moderate	Rapid
Interpretive opportunities	Self discovery	Self discovery	Self discovery with some maps and brochures	Limited signing and maps, brochures and guidebooks, guided hikes	Self discovery	Self discovery, with some maps and brochures	Site facilities, maps, brochures, guidebooks, fireside programs
Public use restricted	Yes	No	No	No	No	No	No
Seasonal closures	Yes	No	No	No	No	No	Yes
Accessibility	May not be possible	Limited	Moderate	Easy	Easy	Easy	Easy
Management presence	Not noticeable	Not noticeable	Noticeable only at access points	Readily apparent	Noticeable	Noticeable	Readily apparent

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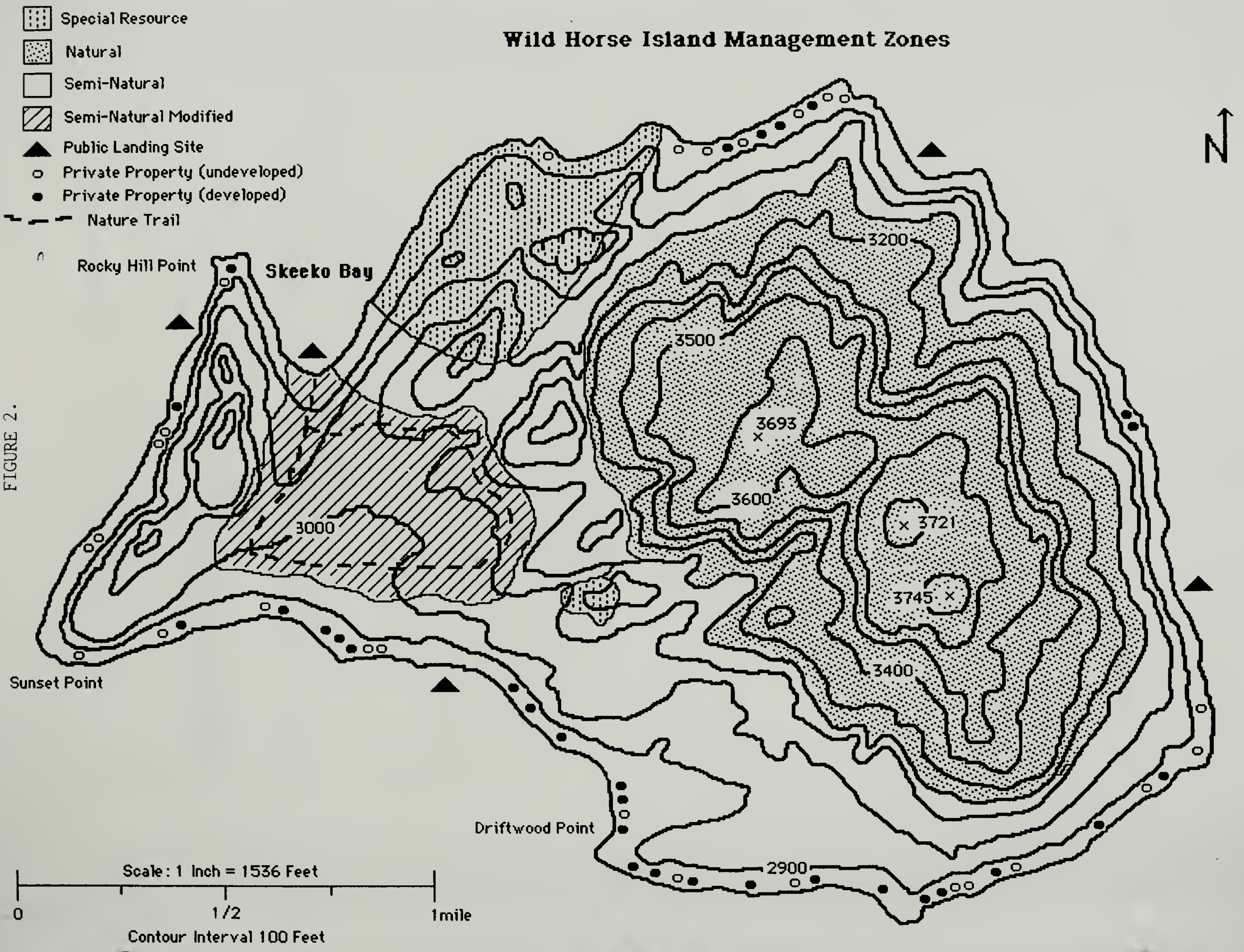
TABLE 1. (cont.)

RECREATIONAL OPPORTUNITY CLASS CHARACTERISTICS	Class 1 Special Resource Zone	Class 2 Natural	Class 3 Semi-Natural	Class 4 Semi-Natural Modified	Class 5 Semi-Natural Motorized	Class 6 MODIFIED-Natural Motorized	Class 7 Modified-RURAL MOTORIZED
Recreation Activities	Hiking (Limited by Seasonal Closures)	Hiking, picnicking, wildlife viewing, photography, outdoor skills development	Hiking, picnicking, wildlife viewing, photography, outdoor skills development	Hiking, guided hikes, camping (site specific) picnicking, Photography	Camping, hiking, picnicking, fishing, boating	Camping, hiking, picnicking, fishing, boating	Camping, hiking, picnicking, fishing, boating
Site Modification	None	Limited	Limited	Moderate	Limited	Moderate	Extreme
Motorized use	No	No	No	No	Yes	Yes	Yes
Facilities	None	None	Health and safety	Health, safety and interpretation	Health and safety facilities within walking distance	Health, safety and recreation facilities	Health, safety, recreation, and interpretation facilities
Trails	None	Not developed or maintained	Semi-developed or Level 1	Developed or Level 2	Semi Developed ~~and~~ maintained ~~Level 2~~ [illegible]	Developed and maintained Level 2	Developed and maintained Level 3
Signing	Boundary marking	None	Limited and infrequent	Yes	Limited	Yes	Yes
Ranger Patrols	Frequent patrols around perimeter	Infrequent	Limited	Regular	Regular	Regular	Frequent
Roadways	None	None	None	None	Unsurfaced	Low-Standard Gravel	High-Standard Gravel, or Paved

REF:MW066.94

FIGURE 2.



Wild Horse Island Management Zones

quality for the resource.

B. Definitions

a. Dispersed Recreation - Division approved activities, which occur in areas other than those with developed facilities such as campgrounds or picnic areas. The location of these areas is accessible by foot travel or boat.

b. Recreational Opportunity - those opportunities available to the visitor, which allows them to seek satisfying experiences through activities in preferred settings.

c. Preferred Settings - the combination of physical, biological, social and managerial conditions that give value to a place.

d. Zoning - refers to different management approaches/actions for different sections of a primitive area.

e. Displacement - the changing of participation in recreation opportunities due to dissatisfaction by not being able to attain what is desired. Displacement from one recreation opportunity to another can be caused by a variety of reasons (e.g. available activities/settings change).

C. Procedure

The following steps are guidelines to be used for LAC zoning of Wild Horse Island.

a. Zones (compartments) should be established according to the following criteria:

1. Use patterns within a zone should be similar.
2. The topography of the zone should be uniform.
3. Trailheads and the travel routes to all areas of the zone should be comparable.
4. Areas of similar vegetation types will be included where possible.
5. Presence of threatened and endangered species.

b. The amount and type of use an area can support is dependent on the type of use for which it is managed. In determining what is an acceptable change it is necessary to develop specific objectives for each area. Wild Horse Island has been divided into four zones (Appendix C.).

Objectives for Special Resource Zone - To protect threatened and endangered species and other identified special resources from disturbance by visitors.

Objective for Natural Zone - Provide opportunities to fulfill desires for solitude and isolation, self-reliance and achievement, to engage in activities requiring high amounts of physical effort and risk taking, where interparty contact is low, and security (availability of help in an emergency) minimal.

Objective for Semi-Natural Zone -Provide opportunities to learn or develop outdoor skills, to view wildlife in a natural setting where security and risk is moderate.

Objective for Semi-Natural Modified Zone -Provide opportunities for environmental education. To view wildlife and historical sites, learn or develop outdoor skills, enjoy family togetherness and engage in activities where small groups may interact, where security is high and risk minimal.

c. Once management objectives are set for each zone then an opportunity class is defined. Most primitive areas contain a variety of physical and biological attributes, use levels and opportunities to recreate. Opportunity classes describe the units where different resource, social, and managerial conditions will be maintained. The classes reflect management objectives for the particular area.

Class 1 (Special Resource Zone) - This class represents a special classification and is primarily for the protection of threatened and endangered species and other identified resources of special interest. Some areas may be permanently closed to public access except under special permit. Other areas may be seasonal closures. When access is possible, the area may provide excellent interpretive opportunities.
The area is not measurably affected by visitation, and impacts are not usually noticeable and recover annually. No facilities or trails are provided. Signing is limited to area boundary marking. When closed, area is monitored by frequent Ranger Patrols around perimeter.

Class 2 (Natural) - This class provides outstanding opportunities for isolation and solitude. Ecological conditions are not measurably affected by the visitor. Impacts are not readily apparent and normally recover annually. Trails are not developed, are widely scattered, generally unmarked and not maintained. Challenge in this zone is high in that visitors must rely on their own abilities and skills. Signing is absent. Ranger patrols are very infrequent.
No facilities are provided. Response time to emergency situations is slow. Access is limited in that terrain features will discourage many visitors from travelling in this area.
Group contacts through the area will be few

and very rare. Interpretation is through self-discovery. Management presence is not noticeable.

Class 3 (Semi-Natural) - This class provides excellent opportunities to experience nature and wildlife and scenic viewing. It may include popular recreation and wildlife areas with developed trails and trail maintenance levels. The number of area encounters is moderate and chances of group interaction is minimal. Impacts may be visible and remain from year to year, but are confined. No facilities are provided except for health or safety concerns. Signing would be limited and infrequent. Management presence is not readily apparent except at access points. Interpretation is through self-discovery with some use of maps and brochures. Ranger Patrols are scheduled on a limited basis.

Class 4 (Semi-Natural Modified) - This class provides opportunities to experience nature and wildlife and scenic viewing in a family setting. Educational experiences are emphasized. Interpretation is through limited site facilities and includes maps, brochures and guidebooks. It includes popular recreation areas with a developed nature trail and trail maintenance levels. The level of encounters may be moderate to high and chances of group interaction is likely during peak seasons. Impacts are usually visible and remain from year to year, but are confined. Facilities may be provided for health and safety concerns and for educational purposes. Management presence is readily apparent and ranger patrols are scheduled on a regular basis.

d. The next step in the procedure is to select indicators of changes. Indicators are specific variables that singly or in combination are taken as indicative of the overall condition of a particular opportunity class. No single indicator is a comprehensive measure, but only a part of what management seeks to achieve through it's objectives. It is unrealistic to assess the present condition and change in every resource and social feature on Wild Horse Island, a limited number of indicators will be selected as measures of the overall condition of an area. These examples of indicators relate as directly as possible to the objective set.

Social Indicators

- parties at trailhead per day
- average party size
- average length of stay
- # of encounters per trip
- total # of visitors
- width of trail
- # of access trails

Biophysical Indicators

- # of bighorn sheep, mule deer & wild horses
- % of forest vs prairie
- vigor and population of selected native plant species
- classification of impacted sites (includes: vegetation loss, bare soil increase, cleanliness, etc.)
- threatened and endangered species reduction
- water quality

- litter per segment of trail
- conflicts between visitors and private owners
- presence of noxious weeds
- vigor and population of selected wildlife species

Criteria for selecting indicators

- Indicator must be able to be measured in an accurate cost-effective manner.
- The condition of the indicator should reflect a relationship to the amount and type of use occurring.
- Social indicators should be related to issues of concern.
- The condition of the indicator should be capable of being influenced by management action.

e. In the next step, the existing condition of the resource and social conditions are inventoried. This information provides the basis for setting standards for each indicator. The necessary data will include visitor use and distribution, visitor impacts, wildlife population counts, and range and forest conditions.

f. After indicators are determined, standards must be set. The purpose of this is to provide a reference point, so that when the current quality of the resource or its uses approach, equal or exceed such a point, mitigating action will be taken by management. Over the different opportunity classes standards will describe a gradation of conditions. For example, the number of acceptable encounters in the semi-primitive zone will be higher than that – found in the most primitive zone. Standards that are set will be fairly subjective at first, and represent desired conditions until such time as management is able to evaluate their effectiveness in protecting the resource and the recreational opportunities managed for in a given area. However, it must be kept in mind that whatever standard is set, it must relate back to maintaining the objectives and opportunity class of a given zone. Examples of standards would include: maximum acceptable number of visitor encounters per day, total number of visitors per access point, maximum number of bighorn sheep and mule deer.

Standards for Indicators

TBA – currently being developed

g. After indicators and standards are set, then management actions to achieve the desired objectives are identified. Again it must be emphasized that the identified actions must be conducive to the objectives and opportunity class of a given zone. For example, designated trails, toilets, and picnic tables do not fit into a primitive classification, where development and management presence are minimal. Management action can take the form of regulations (e.g. no pets, no camping, group size limits).

Management Actions to Maintain Standards

TBA

h. Evaluation, selection and implementation of preferred alternatives is the next step. Management actions would be evaluated and selected through use of the Management Strategy Matrix (Appendix L). Basically this involves comparing alternatives against each other by means of a set of decision criteria.

i. In this step, a monitoring program is initiated which focuses on the indicators and standards previously developed. Monitoring involves collection of information on the selected indicators for the purpose of evaluating how close current conditions are to the prescribed standards. It can be used to determine why conditions are acceptable or unacceptable and provide information for developing, analyzing and implementing any necessary changes in direction.

j. Monitoring Methodology

The monitoring process must not only measure impacts directly related to recreational use, but also those changes as a result of indirect human activities. These would include soil disturbance and overgrazing from wildlife, encroachment of forest on prairie areas, introduction of exotic plant species, noxious weed and insect infestations and tree diseases.

The methodology needed to monitor the selected indicators is currently being developed.

APPENDIX D

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MEPA/NEPA/HB495 CHECKLIST

PART I. PROPOSED ACTION DESCRIPTION

1. **Type of Proposed State Action** Weed control, limited controlled burns, construction of nature trail, homestead building stabilization and fencing removal, informational and educational enhancement, removal of excess Bighorn Sheep and Mule Deer, purchase of selected private lots, group size limits, established landing sites, implement zone management and Limits of Acceptable Change (LAC) Management System.

2. **Agency Authority for the Proposed Action** Montana Department of Fish, Wildlife and Parks RCM 23-1-102, 23-1-110, 23-1-107

3. **Name of Project** Flathead Lake State Park - Wild Horse Island: 1994 Management Plan update

4. **Name, Address and Phone Number of Project Sponsor (if other than the agency)** N/A

5. **If Applicable:**

   Estimated Construction/Commencement Date N/A
   Estimated Completion Date N/A
   Current Status of Project Design (% complete) N/A

6. **Location Affected by Proposed Action (county, range and township)** T24N, R21W, Sections 12, 13, 14; T24N, R20W, Sections 7, 8, 17, 18, 19, 20

7. **Project Size: Estimate the number of acres that would be directly affected that are currently:**

   (a) Developed:
   residential ..... 0 acres
   industrial ...... 0 acres

   (b) Open Space/Woodlands/Recreation ... 2,160 acres

   (c) Wetlands/Riparian Areas .... 0 acres

   (d) Floodplain .... 0 acres

   (e) Productive:
   irrigated cropland ..... 0 acres
   dry cropland .... 0 acres
   forestry .... 0 acres
   rangeland .... 0 acres
   other .... 0 acres

8. **Map/site plan: attach an original 8 1/2" x 11" or larger section of the most recent USGS 7.5' series topographic map showing the location and boundaries of the area that would be affected by the proposed action. A different map scale may be substituted if more appropriate or if required by agency rule. If available, a site plan should also be attached. (Addendum A.)**

Rev. 3/93

9. Narrative Summary of the Proposed Action or Project including the Benefits and Purpose of the Proposed Action.

The purpose of the proposed project is to develop solutions to eliminate or mitigate identified existing problems and to implement a management system which will further define management objectives, establish criteria and standards for resource impacts and monitor conditions over time. In so doing, this agency can better anticipate and initiate actions to maintain the present character of Wild Horse Island while providing a range of recreational opportunities for the visitor. The proposed actions for the project include:

1) establish recommended landing sites to control access and visitor impacts;
2) establish a self-guided nature trail with limited interpretive signing to enhance educational opportunities;
3) provide better information for understanding and appreciation of Wild Horse Island's attributes and environmental concerns through brochures and teacher's packet;
4) weed control measures to eradicate knapweed, leafy spurge and control Canada Thistle;
5) remove excess Bighorn Sheep and Mule Deer to prevent overgrazing and maintain healthy populations;
6) implement zone management to control visitation and related resource impacts (refer to management plan update, Appendix C);
7) upon available funding, purchase selected lots to protect wildlife habitat, historic sites and reduce public user versus private property owner conflicts;
8) reduction of group size limits to reduce social and physical impact of large groups;
9) limited controlled burn for enhancement of the Palouse Prairie and rare and endangered plant species;
10) historic building stabilization for site preservation and fencing removal for visitor safety.

Currently, visitation is increasing in the Flathead Valley and this growth is expected to continue. With the emphasis on tourism that has been evident the last few years in Montana, it is anticipated that visitation to Wild Horse Island will reflect the present trends. Because this park is an island, there are limiting factors as to the maximum populations of wildlife species it can support, and the amount of visitation that can be allowed without detrimental effects. The above actions will help to maintain the natural characteristics of the park, while still allowing a variety of quality recreational opportunities for the public.

10. Listing of any other Local, State or Federal agency that has overlapping or additional jurisdiction.

(a) Permits:

Agency Name	Permit	Date Filed/#
None		

(b) Funding:

Agency Name	Funding Amount

(c) Other Overlapping or Additional Jurisdictional Responsibilities:

Agency Name	Type of Responsibility
Confederated Salish and Kootenai Tribes	Tribal Authority, Flathead Indian Reservation
Montana Department of State Lands	Fire Suppression

11. List of Agencies Consulted During Preparation of the EA:

The Nature Conservancy
Montana State University Extension Weed Specialist
Lake County
Sanders County Extension Agent and Range Scientist
Confederated Salish and Kootenai Tribes

PART II. ENVIRONMENTAL REVIEW

PHYSICAL ENVIRONMENT

1. LAND RESOURCES Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
▶ a. Soil instability or changes in geologic substructure?		x				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?			x		Yes	b.
▶ c. Destruction, covering or modification of any unique geologic or physical features?		x				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		x				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		x				
f. Other __________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

b. Construction of nature trail would result in loss of vegetation and soil compaction within width and length of trail. In addition, due to the mentioned results some erosion could occur from runoff. Mitigation of impacts would include use of existing game trails as much as possible where vegetation loss and soil compaction has already occurred. Also, trail standards of maximum of 18" width and 10 percent sustained grade with natural surfaces would be followed (Alberta Recreation and Parks, Recreation Trails, 1989, p 50). Water bars would be utilized for runoff diversion and erosion control. Currently, some erosion is occurring on existing game trails used by visitors. A developed nature trail with adequate erosion controls will reduce this impact.

PHYSICAL ENVIRONMENT

2. AIR Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
▶ a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))			x		Yes	a.
b. Creation of objectionable odors?		x				
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		x				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		x				
e. ◆For P-R/D-J projects, will the project result in any discharge which will conflict with federal or state air quality regs? (Also see 2a)		N/A				
f. Other ____________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Air Resources (Attach additional pages of narrative if needed):

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

a. A limited controlled burn may have a minimal temporary effect on air quality. This action is an attempt to determine if controlled burning is feasible on Wild Horse island. Mitigation would be achieved by limiting burn to one small area of the prairie (to include location of Silene spaldingii). Total acreage burned would be dependent on adequate equipment and personnel for control and recommendations of controlled burn experts. All burning would occur in the spring or during wet periods and would be in compliance with all Tribal and County regulations. Permits would be obtained prior to any burning when required.

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▸ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

PHYSICAL ENVIRONMENT

3. WATER Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
▶ a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?		x				
b. Changes in drainage patterns or the rate and amount of surface runoff?			x		Yes	b.
c. Alteration of the course or magnitude of flood water or other flows?		x				
d. Changes in the amount of surface water in any water body or creation of a new water body?		x				
e. Exposure of people or property to water related hazards such as flooding?		x				
f. Changes in the quality of groundwater?		x				
g. Changes in the quantity of groundwater?		x				
h. Increase in risk of contamination of surface or groundwater?		x				
i. Effects on any existing water right or reservation?		x				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		x				
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		x				
l. ♦♦For P-R/D-J, will the project affect a designated floodplain? (Also see 3c)		N/A				
m. ♦For P-R/D-J, will the project result in any discharge that will affect federal or state water quality regulations? (Also see 3a)		N/A				
n. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Water Resources (Attach additional pages of narrative if needed):

b. Proposed nature trail would cause minor change to drainage pattern in confined areas, but impact would be mitigated by use of water bars when necessary. Developed trail with erosion control measures would lessen erosion now occurring on game trails used by visitors.

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

♦ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

♦♦ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

PHYSICAL ENVIRONMENT

4. VEGETATION Will the proposed action result in:	IMPACT ✪				Can Impact Be Mitigated ✪	Comment Index
	Unknown ✪	None	Minor ✪	Potentially Significant		
▸a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?				x (positive)	N/A	a.
b. Alteration of a plant community?				x (positive)	N/A	b.
c. Adverse effects on any unique, rare, threatened, or endangered species?		x				
d. Reduction in acreage or productivity of any agricultural land?		x				
e. Establishment or spread of noxious weeds?		x				
f. ♦♦For P-R/D-J, will the project affect wetlands, or prime and unique farmland?						
g. Other: ____________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

a. Removal of some invading Ponderosa Pine from the Palouse Prairie vegetative community would benefit prairie ecosystem and would have no impact on Ponderosa Pine community, as reduction would better approximate the historical species distribution. Mechanical removal as opposed to chemical use or burning would have minimal impact to surrounding vegetation.

Limited controlled burning would benefit the rare plant species Silene spaldingii and the Palouse Prairie vegetative community which depends upon periodic fire for maintenance of a healthy ecosystem. The result is a positive impact.

Removal of excess numbers of bighorn sheep and mule deer will reduce effects of overgrazing and improve range vegetative conditions.

b. Removal and control of noxious weeds would significantly benefit the entire ecosystem. Chemical treatment of weeds through application of Tordon would be utilized at sites deemed safe for its use. At sites not meeting requirements for safe Tordon application, alternative, but less effective herbicides, such as Transline, Stinger or Roundup, or mechanical means (hand pulling) would be applied. All applications would follow weed plan policy and procedures and be conducted by licensed applicator.

✪ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▸ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

♦ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

♦♦ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

▶ 5. FISH/WILDLIFE Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
a. Deterioration of critical fish or wildlife habitat?		x				
b. Changes in the diversity or abundance of game animals or bird species?				x (positive)	N/A	b.
c. Changes in the diversity or abundance of nongame species?		x				
d. Introduction of new species into an area?		x				
e. Creation of a barrier to the migration or movement of animals?		x				
f. Adverse effects on any unique, rare, threatened, or endangered species?			x		Yes	f.
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?			x		Yes	g.
h. ◆◆For P-R/D-J, will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)		N/A				
i. ◆For P-R/D-J, will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		N/A				
j. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

b. Removal of Bighorn Sheep and Mule Deer would reduce abundance of both species; however, presently the abundance of these species exceed the population ranges established in the existing management plan and removal would benefit the species and range areas. Proposed population ranges and sex ratio targets for island ungulates are: Rocky Mountain Bighorn 75-150/50-50; Mule Deer 50-125/50-50; Wild Horses 3-5/geldings only. These numbers could be adjusted if future range analysis should warrant changes.

f. It is undetermined whether a nature trail will increase use at Skeeko Bay as this area is traditionally popular. Studies by Tribal biologists indicate the nesting Bald Eagles which utilize this area are more tolerant to human disturbance than would be expected, but threshold level has not been established. Implementing zoning and LAC indicators and standards would control future increases in visitors to the island thereby mitigating visitation affects. Trail location would be away from vicinity of the nest. In addition, mitigation will be achieved through temporary closure of the Bald Eagle nesting area during sensitive periods. Purchase of private lot within proposed special resource zone would help prevent disturbance to the bald eagles should current owners decide to develop their property.

g. Periodic Removal of Bighorn Sheep and Mule Deer will limit their abundance, but actually benefit the populations of both as there is limited forage available. Keeping total numbers at suggested levels will result in healthier individual animals. The wild horse population will continue to consist of nonreproducing animals. It will be augmented to keep it between 3 - 5 horses as die-offs occur.

Anticipated increases in human visitation to entire island could cause some disturbance to wildlife especially the Bald Eagle pair that nest near Skeeko Bay. This impact can be mitigated by temporary closure of area near the nest during sensitive periods and through implementation of zoning and LAC. These approaches should also limit disturbance to other wildlife populations. (Draft Management Plan Update, Appendix C.) and (ADDENDUM B)

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS Will the proposed action result in:	IMPACT ✪				Can Impact Be Mitigated ✪	Comment Index
	Unknown ✪	None	Minor ✪	Potentially Significant		
a. Increases in existing noise levels?			x		Yes	a.
b. Exposure of people to severe or nuisance noise levels?		x				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		x				
d. Interference with radio or television reception and operation?		x				
e. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

a. Some minor increase in noise levels from power boats may occur at recommended landing areas as this action could concentrate boating activity. At present, anticipated use of these areas would not be sufficient to warrant management action other than asking for voluntary wakeless speeds when approaching these sites through informational brochures and personal contacts. If in the future use increases to create a significant problem, steps may be taken through joint efforts with Confederated Salish & Kootenai Tribes to create a wakeless zone around the island or in selected areas.

HUMAN ENVIRONMENT

7. LAND USE Will the proposed action result in:	IMPACT ✪				Can Impact Be Mitigated ✪	Comment Index
	Unknown ✪	None	Minor ✪	Potentially Significant		
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		x				
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		x				b.
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		x				
d. Adverse effects on or relocation of residences?		x				
e. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

b. Construction of low impact nature trail with limited interpretive signing will not conflict with primitive park status and would enhance educational opportunities.

✪ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▸ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

8. RISK/HEALTH HAZARDS Will the proposed action result in:	IMPACT ☼				Can Impact Be Mitigated ☼	Comment Index
	Unknown ☼	None	Minor ☼	Potentially Significant		
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			x		Yes	a.
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		x				
c. Creation of any human health hazard or potential hazard?		x				
d. ♦For P-R/D-J, will any chemical toxicants be used? (Also see 8a)		N/A				
e. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

a. Chemical treatment of weeds through application of Tordon would be utilized at sites deemed safe for its use. At sites not meeting requirements for safe Tordon application, alternative, but less effective herbicides, such as Transline, Stinger or Roundup, or mechanical means (hand pulling) would be applied. All applications would follow weed plan policy and procedures and be conducted by licensed applicator. Removal and control of noxious weeds would benefit entire vegetative community.

HUMAN ENVIRONMENT

9. COMMUNITY IMPACT Will the proposed action result in:	IMPACT ☼				Can Impact Be Mitigated ☼	Comment Index
	Unknown ☼	None	Minor ☼	Potentially Significant		
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		x				
b. Alteration of the social structure of a community?		x				
c. Alteration of the level or distribution of employment or community or personal income?		x				
d. Changes in industrial or commercial activity?		x				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		x				
f. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

► Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

♦ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

♦♦ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

10. PUBLIC SERVICES/TAXES/UTILITIES	IMPACT ☼				Can Impact Be Mitigated ☼	Comment Index
Will the proposed action result in:	Unknown ☼	None	Minor ☼	Potentially Significant		
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify: ____________		x				
b. Will the proposed action have an effect upon the local or state tax base and revenues?			x			b.
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		x				
d. Will the proposed action result in increased used of any energy source?		x				
▶ e. Define projected revenue sources			x			e.
▶ f. Define projected maintenance costs.			x			f.
g. Other:____________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

b. Purchase of selected private lots would decrease county property tax revenues.

e. f. Revenue sources would consist of: Revenue Sources

General Fund	$ 5,000
Coal Tax	18,546
	$23,546

Projected personal services and operations costs:

Personal Services	$19,546
Operations	4,000
	$23,546

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

▶ 11. AESTHETICS/RECREATION Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?			x		Yes	a.
b. Alteration of the aesthetic character of a community or neighborhood?		x				
▶c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			x		Yes	c.
d. ◆For P-R/D-J, will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		N/A				
e. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

a. Nature trail and trailhead signing will create some visual impacts. These can be mitigated through construction of low impact trail and use of limited signing designed with aesthetic qualities in mind.

Removal of barbwire and fencing and import of materials for historic building stabilization may necessitate use of motorized vehicles. This impact could be mitigated by use of the vehicles in the late fall after the high use visitor season and when vegetative growth has ceased. Tracks would disappear in the spring when winter snow melts and new growth emerges.

c. Because of the nature trail and addition of limited signing, some visitors may experience a loss of a quality opportunity. However, overall the self-guided nature trail would enhance recreational/education opportunities by providing a limited interpretive program for those not acquainted with Wild Horse Island without the need for tour guides. The trail would also offer some structure and guidance for visitors new to the outdoors (i.e. where to go and what to look for).

The zoning and LAC implementation will enhance recreational opportunities. As different areas are managed for different opportunities within constraints of legislation, more recreational opportunities will be available. The quality of the opportunity may be diminished in some specific locations for some visitors, but it would be enhanced for others. For those displaced from one area, the same quality of recreation opportunity would still be available at other locations on the island.

Reducing group size limits to 12 from 30 without a permit with a maximum group size of 30 will prevent use of the park by some groups or organizations. However, this will be an overall benefit to the resources as large groups create more physical and social impacts.

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

12. CULTURAL/HISTORICAL RESOURCES Will the proposed action result in:	IMPACT☼				Can Impact Be Mitigated☼	Comment Index
	Unknown☼	None	Minor☼	Potentially Significant		
▶ a. Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?			x (positive)		N/A	a.
b. Physical change that would affect unique cultural values?		x				
c. Effects on existing religious or sacred uses of a site or area?		x				
d. ◆◆For P-R/D-J, will the project affect historic or cultural resources? **Attach SHPO letter of clearance.** (Also see 12.a)						
e. Other: ______________						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

a. Stabilization of the homestead building and barn at the Johnson Homestead, will protect the site from further weather-related deterioration. Some temporary visual impacts would occur during renovation period. Limited interpretive signing will provide the visitor with the opportunity to view and understand life as it existed during the Homestead era with minimal impact to the site.

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▶ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

HUMAN ENVIRONMENT

13. SUMMARY EVALUATION OF SIGNIFICANCE Will the proposed action, considered as a whole:	IMPACT ☼				Can Impact Be Mitigated ☼	Comment Index
	Unknown ☼	None	Minor ☼	Potentially Significant		
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)		x				
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		x				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		x				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		x				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			x		Yes	e.
f. ◆For P-R/D-J, is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)						
g. ◆◆For P-R/D-J, list any federal or state permits required.						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

e. The nature trail, establishing preferred landing sites, and interpretive signing actions have generated the most objections, notably from local valley residents who want the island to remain as is. The impacts from these actions can be mitigated by low impact design of the trail and interpretive signing. The perception of these actions of ruining the character of the island are in part generated by the fear of unregulated growth such as that which occurred in the Flathead Valley from 1990-93. The impacts that will occur in the field will have minimal influence on present conditions.

From comments obtained at public meetings in December 1993, it appears that the intent and meaning of the 1993 "Primitive Park" legislation is at the root of much of this controversy. The word "primitive" means different things to different people. Besides Wild Horse Island, the legislature has designated 15 other state parks as primitive. Most have developed facilities such as roadways, campsites, picnic tables, fire grills, boat ramps and docks, water hydrants and vault toilets. The characteristics of these other parks and Wild Horse Island are very different and thus the designation of a park as "primitive" in the legislative sense cannot be equated. The term "Primitive Park" should not be considered a mandate to management toward wilderness-like conditions.

Wild Horse Island, as it exists today, is not in a pristine state. Ninety plus years of human-related influence with activities ranging from cattle and horse ranching to a dude ranch and lodge to introduction of nonindigenous wildlife (Bighorn Sheep and Mule Deer) and plant species (exotic) and cabin development has altered the island's natural state. That is not to say that the island does not have many fine resource attributes worth preserving. The preservation, restoration and opportunity to experience the attributes that remain is the purpose of the actions presented. It is felt the cumulative impacts of the proposed actions would not diminish the character of the resources of Wild Horse Island and in fact would have a positive impact by improving the natural conditions and controlling visitation.

☼ Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or can not be evaluated.

▸ Include a narrative description addressing the items identified in 12.8.604-1a (ARM)

◆ Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.

◆◆ Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

2. Description and analysis of reasonable alternatives (including the no action alternative) to the proposed action whenever alternatives are reasonably available and prudent to consider and a discussion of how the alternatives would be implemented: See Addendum for Description and Analyses. (Addendum C)

I. Under this alternative only the most basic actions would be taken to maintain the current park resource conditions. It would include periodic capture and removal of excess bighorn sheep and mule deer, weed control and selected cutting of encroaching Ponderosa Pine seedlings to protect the Palouse Prairie. In addition, barbwire and fencing from past eras would be removed for public safety and historic structures would be stabilized.

This alternative would help improve the park's prairie conditions because of the removal of bighorn sheep and deer, pine seedlings and noxious weeds, but it would not restore the prairie to a natural state due to the absence of fire. Ground litter/fuels would continue to build up and the future of the rare plant Silene spaldingii on Wild Horse Island would be jeopardized. Visitation control/distribution would not be addressed and only monitored. Environmental education opportunities would not be pursued.

II. This preferred alternative would include the previous actions and: Development of an information/interpretive brochure and teacher's packet; implementation of management zoning; reduction in group size limits; pilot program for controlled burning; establishment of preferred landing sites; construction of a nature/interpretive trail; and purchase of selected private lots.

These actions would not only maintain the current resources, but help restore conditions to a more natural state. Also included in this alternative are mechanisms for controlling and redistributing use patterns while providing necessary information for visitors to make informed choices about the island's attributes. Additionally, this alternative emphasizes environmental education through self-guided methods by providing basic interpretive materials and physical aids. All of the proposed actions in the preferred alternative fall within the guidelines of the island's classification as a natural park.

Any action included in the preferred alternative could be implemented by any of the following: Existing park personnel, volunteers or contracted services. In some cases assistance from other state and federal agencies would be sought.

III. This alternative would include all previous actions plus allow for commercial operations and relocation of a sanitation facility in the Skeeko Bay area.

One commercial guided hiking tour would be authorized and a pit toilet would be placed between Skeeko Bay landing site and the Johnson homestead. A small commercial operation would have little physical impact on the resource yet provide economic opportunity for the operators and a quality experience for the clients. The drawback to this action is that some of the public may feel Wild Horse Island's character is being compromised by the influence of commercial activities. The relocation of the sanitation facility would provide more convenience for visitors and less risk of sanitation related problems. However, there would be some loss in regards to aesthetics, and it may act as a draw for visitors to the area.

IV. No Action - This alternative would result in no attempts to alter the current resource conditions on Wild Horse Island or control visitation. It would leave conditions "as is" and allow present processes to take their course.

Under this alternative resource conditions would degrade. Ungulate wildlife populations would be self-limiting. Vegetative impacts would continue due to overgrazing from wildlife, lack of natural fire and proliferation of noxious weeds. Human related impacts would be unabated. Historic sites would be allowed to deteriorate.

This option would not be in keeping with the Division of Park's legislative mandate of providing quality experiences while managing the park in as near a natural condition as possible.

3. Evaluation and listing of mitigation, stipulation, or other control measures enforceable by the agency or another government agency:

In order to maintain the resources of Wild Horse Island it will be necessary to establish standards for acceptable change for these resources and to initiate mitigation measures when standards are approached, met or exceeded.

Purchase of selected private lots would be done to protect wildlife habitat, historic sites and reduce private property owners vs public user conflict.

Weed control measures would include mechanical and chemical measures. Chemicals would be applied under strict guidelines and in accordance with Department policy.

Nature trail would utilize existing game trails where possible. Any tread work would follow low impact standards of maximum 18" width, water bars for erosion control, and natural surfaces with no other structures.

Signing would be minimal. Most information for interpretive purposes would be found in brochures.

Overgrazed range conditions would be mitigated through periodic removal of Bighorn Sheep and Mule Deer; Wild Horse population would be limited to maximum of five geldings.

Reasons for temporary closures and other special regulatory or voluntary measures would be explained to visitors via brochures and trailhead signings.

If use of motorized vehicles are necessary for wire and fence removal the action would occur at the least disruptive time of the year for visitors and vegetation.

4. Based on the significance criteria evaluated in this EA, is an EIS required? YES / NO If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action:

An EIS is not required as cumulative impacts are judged to be minor and can be mitigated by management controls.

5. Describe the level of public involvement for this project if any and, given the complexity and the seriousness of the environmental issues associated with the proposed action, is the level of public involvement appropriate under the circumstances?

Public comment regarding concession proposals was gathered via a 4/9/93 news release.

Two public meetings to present and discuss alternative strategies occurred, one in Kalispell on 12/15/93 and the other in Polson on 12/16/93. A two week public comment period followed. Notice describing the proposed actions was published following Department guidelines based on Administrative Rules of Montana 12-8-605. To the include the following:

- published legal notice twice, one week apart in local newspaper;
- published notice on states electronic board;
- published legal notice twice, one week apart statewide;
- 30 day comment period following publication of second legal notice.

6. Duration of comment period if any:

See #5.

7. Name, title, address and phone number of the Person(s) Responsible for Preparing the EA:
Jerry Sawyer, Park Manager, Flathead Lake State Park, 490 N. Meridian Rd., Kalispell, MT 59901, (406)752-5501

PART III. NARRATIVE EVALUATION AND COMMENT

(see following page)

/nb

REF:WHI.EA
February 11, 1994

Part III

Narrative Evaluation and Comment

The preferred alternative actions for Wild Horse Island are a means to prevent unacceptable impacts to the park's attributes, while expanding the recreational opportunities. Many comments have been made that the island should remain "as is". If the Division of Parks proceeded with the no action alternative, the island would soon show considerable impact to its' natural resources and State Parks would lose a tremendous opportunity for environmental education. No action would soon result in too many sheep and deer, which would then produce conditions conducive for noxious weeds. The weeds (notably knapweed) would gain a foothold in the palouse prairie community replacing native species. A similar situation exists for the encroachment of Ponderosa pine. The resulting decrease in range conditions would reduce wildlife species vitality. No efforts made to control visitation would lead to additional impacts.

The ecosystem of Wild Horse Island has many parts which are interrelated and one solution to a single problem may affect other areas of the system. A holistic approach is required when it comes to management of the park's resources. To maintain or improve the island's present resource state, it is necessary to take various actions to correct currently existing problems and to anticipate future needs. Included in this rationale would be attempts to protect Bald Eagle nesting habitat and the rare plant Silene spaldingii. The actions chosen to solve biological problems have few if any detrimental impacts and if so they are of a minor and limited nature. These actions can be seen to promote a more natural condition. Little opposition exists to proposals which protect or improve the resources of the island when impacts are readily apparent. But other impacts are occurring of a social nature which must also be addressed.

Most of the debate over the preferred alternative actions lies more toward those which deal with visitation and the subtle social impacts. A common fear is that the actions of signing, development of a nature/interpretive trail, zoning, and established landing sites will increase or promote visitation and result in additional impacts. It is inevitable that visitation will increase on Wild Horse Island. The island has been well promoted by sources other than the Department of Fish, Wildlife and Parks. The question then becomes how will this increase be dealt with? If only actions to mitigate biological resource issues (i.e. too many sheep, encroaching pines etc.) are implemented, there remains the risk of uncontrolled use and there will continue to be problems with trespass, litter, trail and landing site impacts, crowding, illegal activities and other human related effects. The proposed visitor related actions are not meant to encourage use, but rather as a step toward controlling it. Impacts from human use will occur in spite of these proposals. By initiating actions to manage visitation, an attempt is made to direct the impacts so that they occur where they are the least detrimental to the resource or where they can best be mitigated. For instance, directing visitors to preferred landing sites would direct them away from sensitive areas or private docks. Or if a nature trail attracts use to its location, it may also reduce use in other areas. In addition, through improved education efforts, visitors will have an opportunity to learn to appreciate and respect all natural resources and better maintain and preserve them. Signing contributes in this respect as well. Even designated wilderness areas have developed trail systems and signing. In regards to the proposed landing site areas, they are already being utilized. These sites would be impacted regardless of whether there was signing or they were marked on a map. If the decision is made to implement the preferred actions, the Department will monitor the effects of visitation and would consider stricter controls to avoid negative impacts.

In regards to how these actions conform to the statewide comprehensive outdoor recreation plan (SCORP), future park planning, and FWP five year goals, the following can be said:

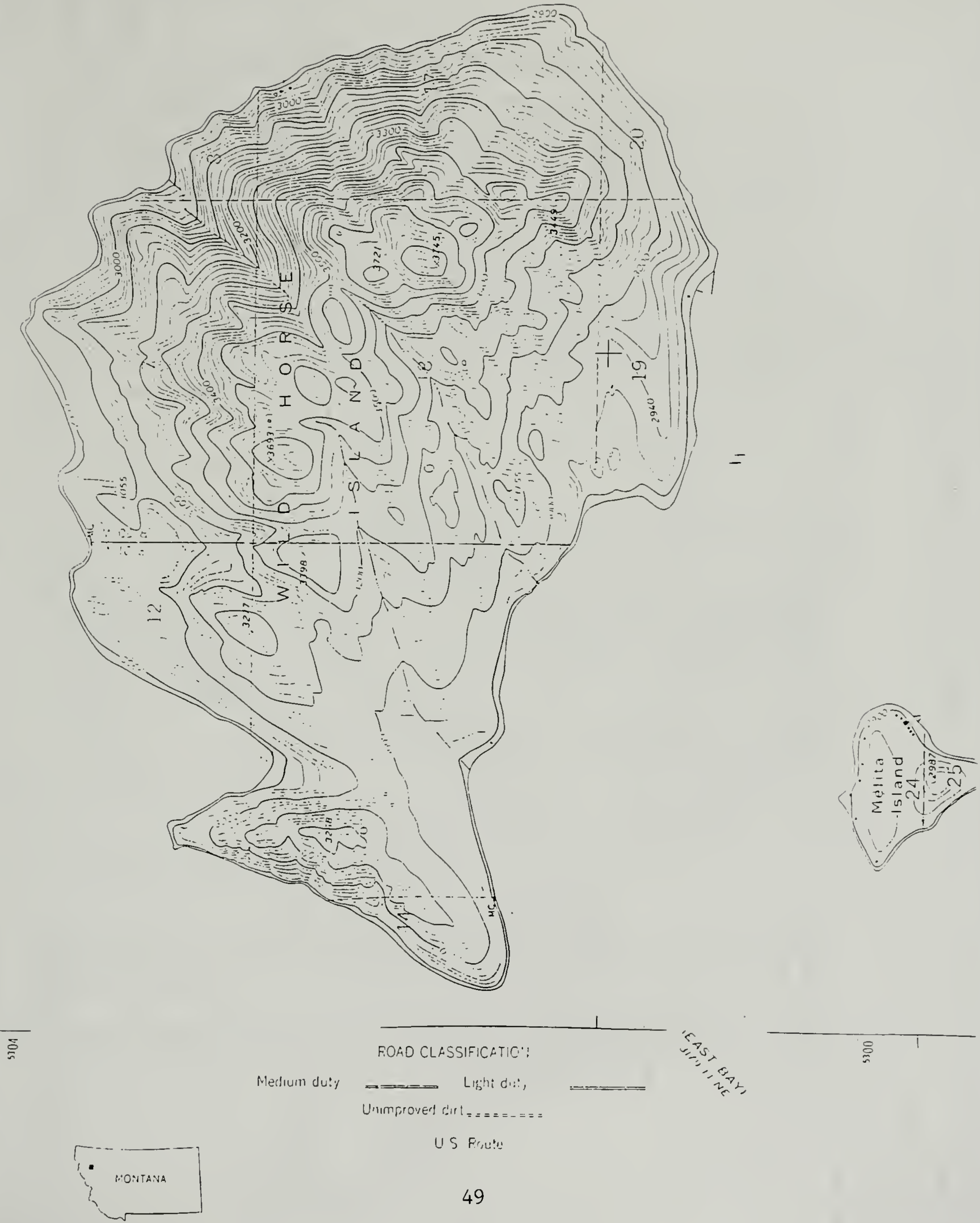
1) These actions are in accordance with the SCORP emphasis on enhancement of day use¯ opportunities (self-guided nature trail) and protection of historic resources (homestead building stabilization), while addressing issues of overcrowding and overuse (Zone Mgmt. & Limits of Acceptable Change System).

2) The actions compliment the FWP five year plan. The nature trail and interpretive and trailhead signing follow Goal B by developing new activities and opportunities for public enjoyment of park resources particularly in regards to historic sites, while providing adequate access and information to insure appropriate use. Nature trail and interpretive signing actions also follow Goal D by elevating the importance of public education and participation so as to afford citizens the opportunity to better understand, appreciate and make informed decisions about cultural and natural resources. All other included actions follow the guidelines of the plan in that they were developed with consideration for a wide spectrum of values within biological,, cultural, social, legal and economic parameters. They are responsive to the needs of the diverse resources of Wild Horse Island and and focus on the ecological system of the area.

3) The actions are the result of a continuing planning process which began in 1978 when Wild Horse Island officially became a State Park. Periodic updates were required and the current proposals are a result of the latest evaluation of current conditions.

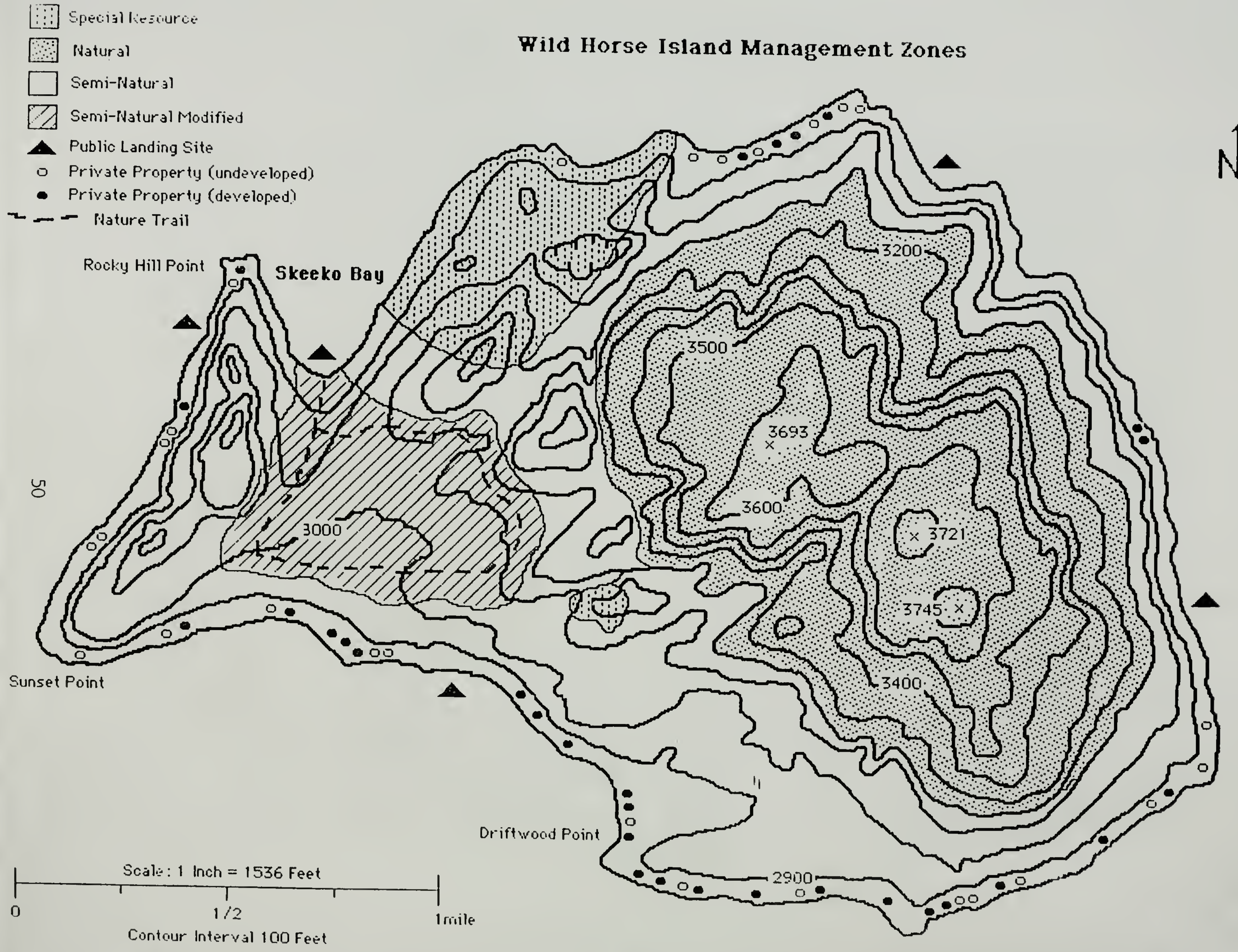
4) Impacts of these actions on the entire state park system are negligible.

ADDENDUM A



WILD HORSE ISLAND, MONT.

Wild Horse Island Management Zones



ADDENDUM C

Wild Horse Island - Environmental Assessment Addendum

Part II

2. Description & Analysis of Reasonable Alternatives

The following section addresses alternatives which have been developed for the various issues relating to Wild Horse Island which can realistically be addressed in the next one-three years. For each issue several alternatives are presented. Although measurable data is not always available, it is not actually necessary to deal in the interim with known problems. At some point, it becomes necessary to develop a solution to an unacceptable or potential problem and take action even if all the data is not in hand. Flexibility in problem solving is essential in the long term. If a solution is not working or a better idea develops later, then current actions will be re-evaluated.

There are generally many alternative means of dealing with a specific issue. In most cases a combination of approaches is likely to be the most successful. Each issue has several alternatives listed with a discussion of the advantages and disadvantages of each. The prefferred alternative action (s) is marked by an asterisk. The actions selected would be followed for an interim three year period until such time as sufficient data is available for analysis to determine changes in management approaches.

Visitation

Current Situation

At present, annual visitation is not well documented. Using 1987 data as the base point and the 4% annual increase found at other area parks, the estimated 1993 visitation is approximately 4500 persons. It is not unreasonable to anticipate use increasing in the future.

The increase since 1987 has resulted in some visible impacts to vegetation, especially at Skeeko Bay, which has traditionally been the most popular public access. Some widening and development of multiple trails has occurred along the path leading to the homestead from Skeeko Bay and the landing area has suffered vegetation loss and bare soil increase. Concerns have arisen over requests for use of the park by larger groups.

Populations of the rare plant species Silene spaldingii is on the decline and impacts due to human disturbance will effect its' ability to survive. Malicious or unwitting disturbance of this plant may eliminate it from the island.

Use of private docks by the public result in trespass situations and increased potential for theft and vandalism to cabins. Currently, no public dock exists and current legislation prohibits construction of a public dock on Wild Horse Island.

Although Wild Horse Island has vast opportunities for environmental education, to date little has been done to formally utilize this potential. There is no program available to schools, recognized organizations or the general public, which emphasizes the natural features of the island for interpretive purposes.

Human disturbance to various wildlife species, especially the bald eagle, is potentially high and reasonable efforts need to be made to reduce disturbance during nesting period.

Alternatives

*1. Establish 4-6 public access landing areas for boats (Addendum B). Although visitors would not be required to land exclusively at these sites, emphasis of these areas for access would be pursued through maps, brochures, news releases and field contacts. These areas would be viewed as trailheads allowing access to the island interior. At each access point would be placed a 4' x 4' bulletin board with pertinent information regarding the island's topography, history, wildlife, regulations and other interpretive type text. Also, visitor registration boxes would be placed near these areas to begin a data collection effort. A main trail leading to the interior could be established a length of 100 -200 feet and then dissipate to where visitors would then disperse on their own (exception of Skeeko Bay with loop nature trail). Although some loss of vegetation may occur at these sites, impacts would be confined.

Advantages

a. Direct visitation away from sensitive areas such as private property and endangered species.

b. Provide direction for visitors who are not familiar with the island. Inland area features could be emphasized through brochures and signing at the trailheads.

c. Data collection would be easier and contribute to more accurate visitation numbers.

Disadvantages

a. Some concentration of use may occur resulting in visible impacts to landing areas and immediate vicinity.

b. Feelings of restriction of freedom may occur for some visitors.

*2. Develop informational brochure to be made available at public access points and at local commercial businesses which emphasizes educational/natural experiences or opportunities available on Wild Horse Island. These brochures would attempt to not only inform visitors, but to spark interest and cultivate appreciation and understanding of natural processes.

Advantages

a. Better information would allow visitors to match preferences with the Island's attributes.

b. Brochures could be easily available to visitors at various locations.

c. An informative brochure would direct visitors to the area of the island that meets their needs.

Disadvantages

a. Brochures are costly to print.

b. Brochures can be viewed as a marketing tool and may result in some increase in visitation.

*3. Develop a teacher's packet targeting grades 5-7, which would provide a collection of ideas and activities for teachers who are planning to introduce their students to the natural environment through a visit to Wild Horse Island. The Parks Division would provide transportation to the island for two, one day outings, each spring and fall. If private transportation can be obtained, the packet would allow teacher's to visit the island anytime their schedules permit and not necessitate a guided tour by park staff.

Advantages

a. Better utilize education potential of Island's natural features.

b. Provide teacher's with specific guide to the island's attributes and better prepare them and students for a field trip.

c. Allow teacher's to guide students rather than utilizing a Department employee.

Disadvantages

a. Cost in time and money to prepare.

b. Providing transportation even on limited basis is costly in time and labor.

*4. Limit group size to 12 persons without a special permit and a maximum of 30 with a permit. This would allow more control over group activities which tend to create more impact. Currently the group size limit is 30 without a permit and no limit with a permit.

Advantages

a. Limiting size would reduce impacts to vegetation and soils especially in fragile and undisturbed areas.

b. Would reduce the dissatisfaction (perception of crowding) of encounters with large groups.

c. Reduce disturbance to wildlife.

Disadvantages

a. Would limit freedom of those who like to travel in large groups (i.e.organizations)

b. Would require additional planning of activities by larger groups. (i.e. securing permit)

c. Force groups over maximum limit to find another area for their activities.

5. No Action

Advantage

a. No "advertising" of Wild Horse Island, hopefully resulting in little increase in use.

b. Perception of less restrictions imposed by the state.

c. Status Quo maintained.

Disadvantages

a. Loss of opportunity for environmental education for schools and visitors.

b. Potential for increased impacts to wildlife and sensitive species from larger groups.

c. Some visitors may not fully benefit from experience as they do not know where to go or what to look for.

Wildlife

Current Situation

The management plan in 1985 called for a sheep population of 50-75 animals, 30 Mule deer and three wild horses. Population range for bighorn sheep was subsequently increased to 75-100 by agreement of the planning task force that developed the 1985 plan. The estimated population at present is 300 sheep, 100 deer and five horses. This has resulted in some areas of the island being overgrazed, especially the higher knoll areas preferred by the sheep. Current estimate is that conditions on the island can support up to 150 sheep, 75 mule deer and 5 wild horses. These levels would result in healthier species and range conditions.

There presently exists a pair of nesting bald eagles which return to the island near the area which is the most popular public access point. Skeeko Bay is the only natural bay around the island and traditionally is used for overnight mooring and as walk-in point for day use visitors. The immediate vicinity serves as a critical foraging area for both the adult eagles during the nesting period and the newly fledged young each year.

Condition of other wildlife appears to be good with no immediate need for action.

Alternatives

*1. Remove 100-150 bighorn sheep and 25 mule deer from the island to reduce the population to previously established limits. Maintain 2-5 wild horses.

Advantages

a. Less impact to range and forest vegetation.

b. Would provide for a healthier more vigorous population.

c. Provide additional animals for reintroduction to other areas in and out of state.

Disadvantages

a. Reduce opportunity for wildlife viewing.

b. Cost of capture and transplanting sheep and deer.

*2. Provide temporary closure of area within 3/8 mile of Bald Eagles nest. Closure would cover time period when nesting eagles are most sensitive to human disturbance. Recommend 3/15 to 7/30. Closure may be regulatory or voluntary.

Advantage

a. Provide protection to nesting area of bald eagles during sensitive periods

Disadvantage

a. Restrict visitors ability to access entire park area.

3. Allow limited hunting by special permit for Bighorn Sheep and Mule Deer

Advantages

a. Maintain population of bighorn sheep and mule deer at desirable levels.

b. Eliminate cost of capture and transporting of these species off the island.

Disadvantages

a. May result in conflicts over hunting jurisdiction with Salish and Kootenai Tribe.

b. May result in conflicts with anti-hunting organizations and cabin owners.

4. No action.

Advantages

a. Better opportunities for wildlife viewing.

b. No restrictions to public.

Disadvantages

a. Replacement of indigenous plant species by exotics due to soil disturbance and overgrazing of palouse prairie.

b. Risk major die-off during hard winter of sheep and deer.

c. Increased disturbance could lead to abandonment of nest by eagles.

Vegetation

Current Situation

The native palouse prairie is being encroached upon by ponderosa pine seedlings resulting in a loss of total range and replacement of native grasses by other plant species.

Open Ponderosa pine stands are being invaded by Douglas fir regeneration on easterly and northerly aspects of the island.

Increases in bighorn sheep and mule deer populations has caused soil disturbances and overgrazed conditions on some areas of the prairie.

The palouse prairie has built up a substantial depth of ground litter due to fire suppression contributing to a reduction in the rare plant Silene spaldingii and an increase in ground fuels.

Some ponderosa pine have suffered pine beetle infestation with resulting beetle kill. A needle disease, Diplodea pinea has infected trees in the southeastern quarter of the island.

Small isolated outbreaks of knapweed have occurred at various locations. Leafy Spurge which was present and treated in 1987, was not located during a recent survey, but could still be present. Canada Thistle has established itself in small pockets throughout the island. It is especially adapted to some of the low lying wet areas where eradication would be difficult. Knapweed is a particularly aggressive weed which will displace native species if not controlled.

Currently, there is Department policy of total suppression of all fires. This intervention of man has altered the natural processes that have historically occurred on the island. The prairie areas rely on periodic fire to remove ground litter and supply nutrients for native grasses. Fire has always been a part of the natural process. Suppression has resulted in a build up of ground fuels and intrusion of prairie areas by ponderosa pine and open park areas by Douglas fir. Past attempts to implement controlled burning as a management tool has met with strong public opposition and was never implemented.

Alternatives

*1. Eradication through mechanical and chemical means of all known knapweed and leafy spurge infestations. Begin chemical spraying for control purposes of areas of Canada Thistle.

Advantages

a. Eliminate possibility of outbreaks of Knapweed and Leafy Spurge (both very aggressive species)

b. Reduce the number of areas of thistle and maintain and encourage regrowth of native species.

Disadvantages

a. Costly in terms of labor and materials.

b. Pollution of the soil by inorganic chemicals for varying time periods.

*2. Begin mechanical control (cutting) of small Ponderosa Pines which are intruding on Palouse Prairie. Start in homestead area and on island's east side.

Advantages

a. Recover areas of palouse prairie and provide additional forage for grazing animals.

b. Maintain historic vegetative characteristics of the island.

c. Can be accomplished without drawbacks of controlled burning.

Disadvantages

a. Labor intensive.

b. Would require removal of cut trees from island or burning piles on-site.

*3. Implement controlled burning of selected grassland area as outlined in the 1989 Draft Fire Mgmt. Plan.

Advantages

a. Restore natural role of fire in maintaining healthy ecosystem.

b. Removal of built up ground fuels, reducing risk of major uncontrolled fire on vegetation and on private lot developments.

Disadvantages

a. Labor intensive and increasingly higher costs as natural fuel loads increase.

b. Strong public opposition.

c. Major repercussions if burning occurs in non-selected areas through natural ignition causes.

*4. Seasonal closure of area where the endangered plant specie Silene spaldingii is known to be located to public travel unless as part of guided hiking tour.

Advantages

a. Would help protect species from accidental or intentional disturbance by visitors.

Disadvantages

a. Restrict freedom of visitor to access the entire park area.

b. Not responsive to why the plant exists and what the plant requires to survive.

5. Chemically treat or cut and remove pines which are infested with beetle or blight.

Advantages

a. Removal or chemical treatment of infested trees would help prevent spread of beetles and disease.

Disadvantages

a. Labor intensive, requiring cutting, and removal or burning of trees on site.

b. Chemical treatment is costly and may cause environmental concerns.

6. No action

Advantages

a. Savings in cost for labor and materials to maintain and restore natural conditions.

Disadvantages

a. High probability of major infestation of grasslands by noxious weeds with resulting loss of native species.

b. Gradual reduction of prairie through forest succession.

c. Potential for human disturbance of endangered plant specie.

d. Reduced vigor of prairie plant species and build up of ground fuels due to elimination of role of fire in the natural ecosystem.

Facilities and Improvements

Current Situation

At present there are no marked trails on the island. All trails currently used by visitors are game trails. These trails often disappear or can lead to sensitive areas. Many visitors do not know where to go on the island or what to look for when they get there.

There is currently one vault toilet on the island for public use. Presently, it is at a location that is difficult to find and thus infrequently utilized.

Buildings and related structures dating back to the early 1900s still exist today and have an important role in the history of Wild Horse Island. However, these structures need to be preserved if they are going to play a part in any future interpretive program for the park.

Signing on the island is virtually non-existent which results in confusion for some visitors. Lack of signing includes any maps, interpretive or other informational efforts.

Safety of the visitor is a major concern of management. There exists a significant amount of barbed wire lying on the ground throughout the island, a result of past ranching activities. This presents a hazard to the visitor and is an eyesore.

The effect of recently passed Primitive Parks Legislation restricts extent of future facility development.

Alternatives

*1. Construct where necessary or mark a self-guided nature trail. Starting at Skeeko Bay access point, the trail would wind up to the Johnson Homestead and then loop around the orchard area and nearby drainages for about 1/2 mile returning to the Homestead. Entire trail would have approximately 12 stations and would be about 3/4 of a mile in length. The maximum trail width would be 18" with natural surfaces. Approximately 75% of the trail would utilize existing game trails. The nature trail would provide an opportunity for education and discovery for those visitors who either do not want to or are incapable of hiking the island. Interpretive signing explaining the era and the historical significance of the homestead would be placed near the buildings along the trail. (also refer to alternative #1 under visitation). A brochure would be developed which explains the features to be noted at the various stations.

Advantages

a. Provide guidance for those who do not know where to go on the island.

b. Provide educational opportunity to explain natural and historical features.

c. Provide sense of security for those visitors who are new to the outdoor environment.

d. Direct use away from sensitive areas (i.e. endangered species, private property).

e. Reduces widespread impacts to the area.

Disadvantages

a. May increase visitation use of the area.

b. Initially increases impact to the resource as trail is established.

*2. Stabilize/preserve buildings at Johnson Homestead site.

Advantages

a. Prevents further deterioration of structures.

b. Provides opportunity for historical interpretation.

Disadvantage

a. Cost for materials, labor, time.

b. May require use of motorized vehicle to move repair materials to the site.

3. Sanitation facility (pit toilet design) to be placed about halfway between Skeeko Bay Trailhead and the Johnson Homestead.

Advantages

a. Provides convenience for the visitor.

b. Eliminates potential for sanitation/litter problem.

Disadvantages

a. Increased resource impact to small area due to trampling and human wastes.

b. Increase in visitor use to this portion of island.

c. Cost of maintenance.

*4. Remove remaining barbwire fencing.

Advantages

a. Eliminates potential hazard to visitors and wildlife.

b. Improves aesthetic value of resources.

Disadvantages

a. Cost in time and labor.

b. May necessitate use of motorized vehicle to expedite removal.

5. No action.

Advantages

a. Reduce concentrated impacts to confined areas.

Disadvantages

a. Loss of education potential.

b. Increased sanitation problems.

c. Inconvenience to park visitors.

d. Risk of widespread impacts as total visitation increases.

e. Leaves wire as potential hazard to hikers and wildlife.

Commercial Concession

Current Situation

At present there is no commercial concession activity on Wild Horse Island. An attempt was made in 1986 to provide guided hiking tours on the island, but this venture fell through and has not been attempted by anyone else since. In the last year several parties have expressed an interest in providing some type of guided service to patrons utilizing Wild Horse Island. These have varied from simple guided hikes to horseback riding and mountain bike excursions.

Any type of commercial activity would need to meet management objectives (i.e. provide recreational opportunities without noticeable impacts to the resource) and intent of current Primitive parks legislation.

Alternatives

1. Authorize one hiking concession on a limited basis. The concession would allow for guided hikes of up to ten persons, once per day, two days a week from 6/1 to 9/1. No weekends. Concessionaire would have to follow strict guidelines set out by the Department including but not limited to landing site, tour area and time of day.

Advantages

a. Reduces impacts of large scale concession operation.

b. Allows opportunity for private enterprise.

c. Participants in tour would receive quality recreational and educational experience.

d. Concessionaire provides information to Department on inappropriate or illegal activities and general resource conditions.

Disadvantages

a. May disturb some visitors due to larger group size.

b. Cost may prohibit some individuals from participation.

c. Strong local public opposition.

2. Resume shuttle service by the Division of Parks out of Big Arm State Park.

Advantages

a. Provides low priced opportunity for non-boating public to visit island.

b. Convenience to visitors at Big Arm State Park and local area.

c. Some indirect control of visitation by limiting the number of persons allowed to visit island through shuttle service (10 per day, 3 days per week).

Disadvantages

a. Expense in equipment, maintenance and labor to Parks Division for operation of service.

b. Eliminates private sector opportunity to provide service.

c. Inconsistent service as a result of other priorities/duties of Parks personnel.

3. Contract out shuttle service (strictly to and from island, no guiding)at same level as Parks provided service.

Advantages

a. Allows for private business opportunity.

b. Removes costs to Parks Division of providing service.

c. Lower price than guided tour allowing opportunity for visit to the island by more of the public.

d. Some control of visitation through restrictions on maximum number of persons per week.

Disadvantages

a. Higher cost to user than state provided transportation.

b. Restrictions on concessionaire of numbers of participants may not make venture profitable.

c. Strong local public opposition.

4. Contract shuttle service at visitation levels which concessionaire feels provides for reasonable profit.

a. Allows for private business opportunity.

b. Removes costs to Parks of providing service.

c. Reduced cost to public.

Disadvantages

a. Acceptable number of participants for reasonable concessionaire profit may create unacceptable impacts to island resources.

b. Would significantly increase visitation over current levels.

c. Strong local public opposition.

*5. No action

Advantages

a. Reduced visitation and subsequent impacts to island.

b. Maintains Legislative intent for Primitive Park areas.

c. Strong local public support.

Disadvantages

a. Many potential visitors will not be able to experience and learn about the island's natural features.

Park Administration

Current Situation

Of the 56 private lots located on the island 27 have been developed. A few of the remaining lots are located in areas which may influence park operations and possible future management options. These lots are primarily located on the west side of the island near Sunset Point and on the north side of the island near Skeeko Bay.

If impacts to the island are to be held in check then certain controls must be placed on visitation. These may take the form of direct (e.g. regulations) or indirect controls (e.g. signing, brochures). If visitation increases as expected in the years ahead it is important to have control mechanisms in place. Currently, there are no control mechanisms in place other than regulations. Visitors are free to roam the island wherever they wish (except private property). This may have an affect in the future on endangered species and for other visitor related impacts.

Alternatives

*1. Purchase selected private lots, to protect wildlife habitat, reduce private vs public conflicts and preserve historic sites.

Advantages

a. Protect sensitive species areas.

b. Protect primitive characteristics of island through less development.

Disadvantages

a. Expensive

*2. Implement Zoning, LAC measures and other indirect controls to prepare for anticipated increases in visitation and to maintain character of the park.

Advantages

a. Anticipates increased visitation as island's popularity grows by directing use to appropriate areas.

b. Provides mechanisms for controlling future visitation and extent of impacts.

c. Maximizes recreational opportunities, while maintaining primitive character of island.

Disadvantages

a. Perceived loss of freedom by some visitors.

b. Will increase impacts to limited areas. (i.e. landing sites, trails)

3. No action

Advantages

a. Savings in budgetary expenses.

Disadvantages

a. Increased potential for impacts to resources due to non-compliance with regulations.

b. Increase potential for vandalism and theft.

c. No field contacts of visitors to assist or provide information.

d. Potential for additional uncontrolled impacts in the future due to increased visitation.

e. More cabin development resulting in disturbance to Bald Eagle nesting and perching areas.

f. More cabin development resulting in increased potential for private vs public user conflicts.

g. Loss of historic site.

h. Substantial reduction in data collection efforts.

Implementation Timeline forProposed Actions

	1994												1995												1996											
Proposed Action	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
SHEEP/DEER TRANSPLANT	*	*																						*	*											
WEED CONTROL					*	*											*	*											*	*						
WIRE/FENCING REMOVAL										*																										
CUT ENCROACHING PINES																*												*								
ZONING						*																														
ESTABLISH LANDING SITES																		*																		
NATURE TRAIL																				*																
BROCHURES/TEACHER'S PACKET						*																														
GROUP SIZE LIMITS						*																														
CONTROLLED BURN																						*														
PURCHASE SELECTED LOTS																																				*
STABILIZE HISTORIC BLDGS.									*																											

The above timeline represents completion dates of the proposed actions. Some actions will necessitate annual, periodic or phased implementation.

APPENDIX E

WILD HORSE ISLAND STATE PARK

EDUCATIONAL PACKET

Montana Department of Fish, Wildlife, and Parks

Fall 1993

FORWARD

This document is designed for educators at the 5th through 8th level. It, as of this time, is very incomplete. Your comments and suggestions would be much appreciated. Should you care for a complete copy of the document, please don't hesitate to inquire.

WILD HORSE ISLAND EDUCATIONAL PACKET

I. A. Introduction
   B. Statement of Purpose

II. General Information
   1. Location
   2. Permits
   3. What to Bring
   4. Park Etiquette

III. Background Information
   1. History
   2. Geology
   3. Glaciation
   4. Climate
   5. Mammals
   6. Horns or Antlers?
   7. Endangered Species
   8. Plant Communities
   9. Current Issues and Management
IV. Pre-visit Activities

V. On-site Activities

VI. Follow-up Activities?

VI. Bibliography

VII. Evaluation Form

WILD HORSE ISLAND STATE PARK

Introduction

Wild Horse Island became a state park in 1978 through the cooperative efforts of the Bourke MacDonald family, The Nature Conservancy, and the State of Montana. In the years prior to its acquisition by the state, Mr. MacDonald--with the help of the Montana Department of Fish, Wildlife, and Parks--managed the area for wildlife and promoted public use.

Through time, this island has come to hold special meaning for those who have visited its rocky shores to hike, picnic, observe wildlife, swim, or simply enjoy the peace of solitude. Exploration of its inner reaches reveals mature Douglas Fir and Ponderosa Pine forests as well as a last remnant of Montana's native grasslands, the Palouse Prairie. Today, the island provides habitat for a variety of birds and mammals, including such species as osprey, bald eagle, canadian goose, bighorn sheep, mule deer, coyote, and--yes--a few "wild" horses.

The source of the island's name has been shrouded by the cloak of time but local legend tells us this:

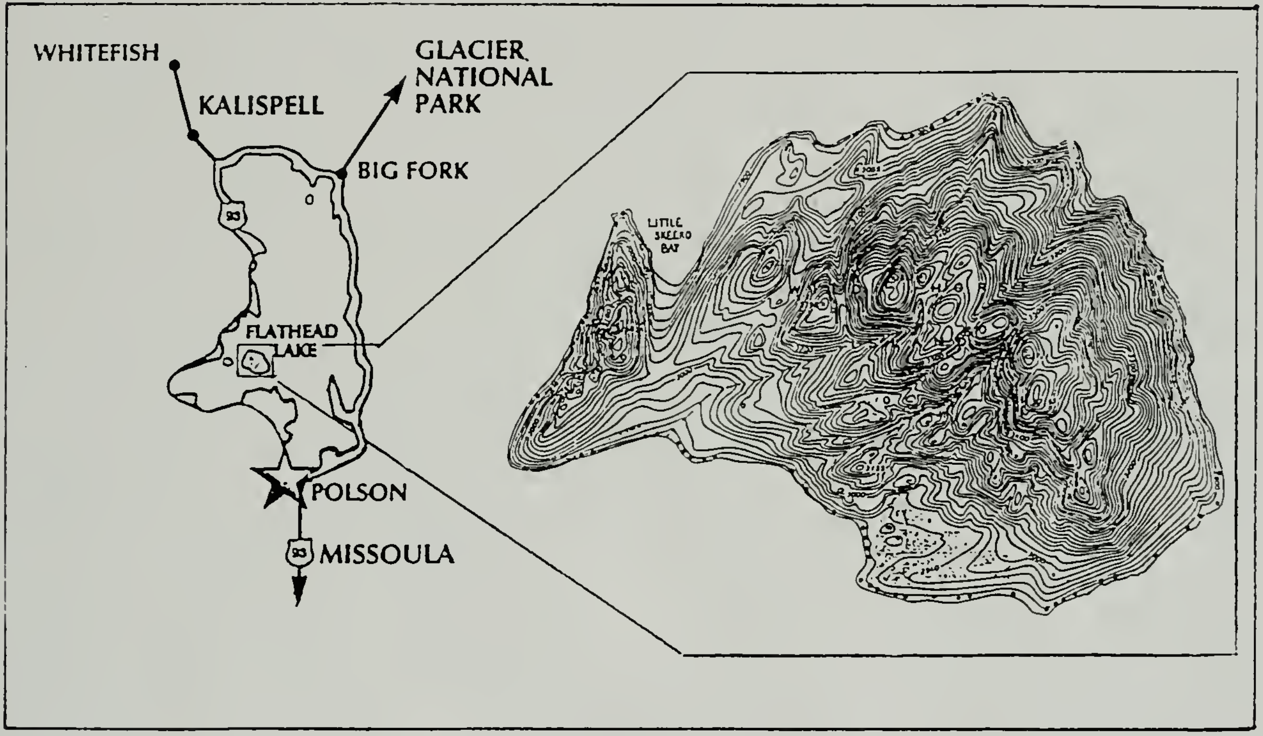
> Long before white incursion into the area we now know as the Flathead Valley, this land was home to a number of native american tribes. Although the imposing mountains of the Continental Divide (what is now Glacier National Park) separated these tribes from their eastern enemies, the Blackfeet, it was not uncommon for the Blackfeet to descend upon them and make off with untold numbers of horses. To counter these raids, the tribes began using land surrounded by the great "flat waters" to hide their valuable steeds. Over time, many of these beautiful creatures escaped capture and a population of wild horses was established on the island. Thus, when the first white people ventured into the area, the island's name was ensured.

Statement of Purpose

Uncomfortable as it may be, our world is changing at a rate that few of us can keep pace with. It is vitally important, therefore, that the generations to come acquire at least a basic knowledge of the forces at work upon it, natural as well as human. Wild Horse Island, a familiar local landmark, provides us with the opportunity to explore a unique natural ecosystem while closely examining the classic dilemma of preservation versus use. The purpose of this educational package is to present local educators with a collection of information and activities that can be integrated into or supplement their current curriculum in such areas as human history, natural history, geography, and art.

GENERAL INFORMATION

Location: Wild Horse Island lies surrounded by the fresh, glacial waters of Flathead Lake, the largest body of fresh water in the west. About one-half mile from the lake's southwest shore, access to the island is via boat from one mainland public access point: Big Arm Bay State Park. Big Arm Bay is located along U.S. Highway 93 about 35 miles south of Kalispell and 12 miles north of Polson. Montana State Parks has only limited ability to transport large groups, but is more than willing to work with educators wishing to facilitate a field trip to the island. **CAUTION:** Visitors are cautioned to secure their boats adequately and be watchful for severe windstorms which can occur suddenly.



Permits: Wild Horse Island is open to the public, but groups of 30 or more must have Department permission. We suggest contacting the office well in advance of your planned trip dates so that the proper arrangements may be made. For further information please contact:

Montana Department of Fish, Wildlife & Parks
attn: Jerry Sawyer
490 N. Meridian Rd.
Kalispell, MT 59901
(406) 752-5501

What to Bring: The weather can change at a moment's notice. We suggest comfortable hiking attire, a warm jacket or sweater, and rain gear. A warm hat, gloves, sunscreen, and a change of clothes always makes you well prepared. Please have with you plenty of water and a lunch if planning a full day on the island.

Park Etiquette: Wild Horse Island has been designated by the state legislature as a Primitive Park. You can help maintain this primitive character by bearing in mind a few simple things.

- There is no designated trail system in the park so we encourage you to walk single file along any of the paths or game trails that are already heavily impacted. If in an area devoid of trails, please spread out. More than 15 steps along the same line in a single year will create a path through previously healthy vegetative cover.
- Wildlife present in the park is just that, wild! This is their home and they have evolved with the means to feed, shelter, and protect themselves. Exposure to human food can disrupt their internal processes and create a dependency that can lead to starvation. PLEASE DO NOT FEED OR APPROACH THE WILDLIFE!
- Everything in the park is protected by law. Please do not destroy, injure or remove any tree, shrub, plant, or any geological or historical feature. Every living thing on this planet depends on the cyclical replenishment of nutrients that dead and decaying plants and animals provide. Please respect the needs of a healthy ecosystem.
- There are no public restroom facilities in the park. Dispose of human waste in a hole six inches deep and well away from water sources and trails. Cover the hole with topsoil and pack out all toilet paper. Also, the salts present in human urine will often lead animals to destroy plants and ground cover. Please use areas of already barren soil or exposed rocks.
- Remember--Pack it in, Pack it out! Litter is unsightly and takes away from the experience of those to come after you. Please keep track of your trash and take it with you when you leave.
- There are 52 privately owned one acre lots located along the perimeter of the island. Roughly 27 of these lots have cabins and boat docks. Visitors are welcome to land anywhere on the public shoreline of the island except for the private cabin sites and docks. Please respect the rights of the lot owners when beaching your boat, picnicking, or hiking near their property.

Help protect the island from degradation
by practicing a no-trace ethic

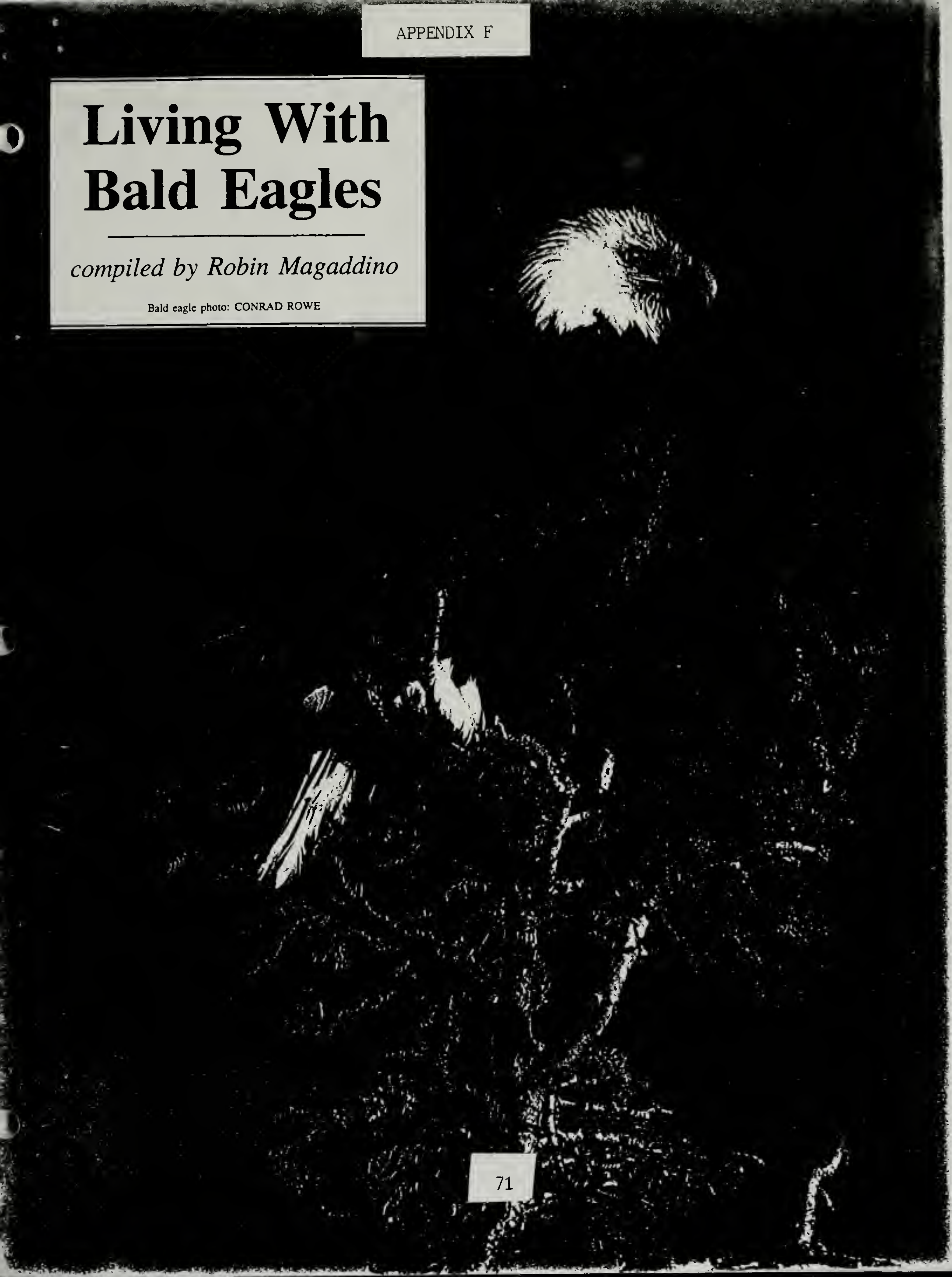
Please...
Take only memories, Leave only footprints

We encourage educators to discuss these concepts with their students prior to visiting the island.

Living With Bald Eagles

compiled by Robin Magaddino

Bald eagle photo: CONRAD ROWE



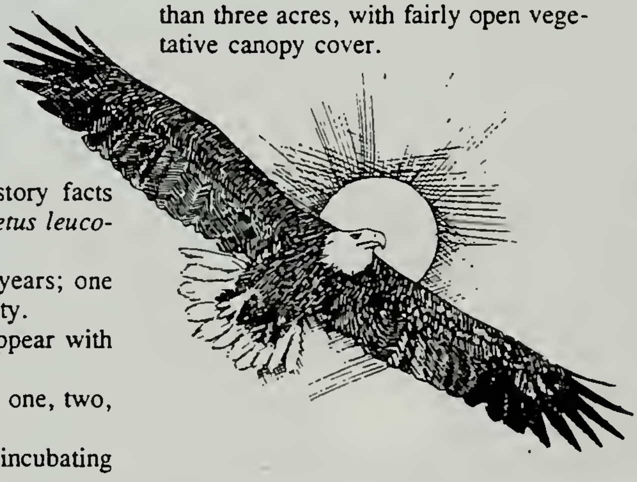
The Montana Bald Eagle Working Group

Increased human understanding of the environment and compassion for other species have helped steer bald eagles away from the path to extinction. Interest and assistance from all Montanans is needed if bald eagles are to thrive in the state. To this end, representatives of state and federal agencies, universities, conservation groups, and private industry founded the Montana Bald Eagle Working Group (MBEWG) in 1982. It was created to serve as technical adviser for research, management, inventory, and monitoring of bald eagles and their habitats in Montana and to provide a forum for exchange of this information. Intensive surveys have helped to identify many bald eagle nesting, roosting, and perching sites throughout the state.

Private landowners or land-use planners whose property supports bald eagle nesting, feeding, or roosting habitat have the opportunity to assist with bald eagle conservation in Montana. Please accept this invitation to join in partnership with both public and private land managers for conservation of our national symbol.

Why Do Bald Eagles Need Our Help?

Our growth and prosperity as a nation has often adversely affected wildlife species. Certain human activities at inappropriate times; cutting nest trees, roost trees, or adjacent forest stands; shooting; inadvertent poisoning; and contamination of the eagles' food supply continue to affect Montana's bald eagle population. Only through conscious efforts to reduce impacts will eagles flourish. Information about bald eagles and suggested ways to manage property for both private needs and the needs of bald eagles is contained in this article.



Natural History

Here are some natural history facts about the bald eagle, *Haliaeetus leucocephalus*:

- Bald eagles live up to 45 years; one survived to age 75 in captivity.
- The white head and tail appear with sexual maturity at 4-5 years.
- A successful pair produces one, two, or occasionally three young.
- Both parents share in incubating eggs; incubation lasts about 35 days.
- Young leave the nest after 11-14 weeks.
- The bald eagle is the largest bird of prey in Montana. It weighs from 7-13 pounds and has a 7 1/2-foot wingspan. Females are 30% larger than males.
- Eagles live year-round in Montana.
- Migration peaks in March and November.
- Migrants nest as far north as the Northwest Territories, Canada, and migrate south to most of the western states.
- Throughout the year, fish, waterfowl, and the remains of dead animals, such as deer and cattle, are the major food items.

Current Status

Current population trends show a promising increase in nesting bald eagles within Montana. As the impact of DDT diminishes, more young birds hatch and survive. The nesting bald eagle population in Montana has increased by an average of 15% per year, and eagles have occupied vacant historical nesting territories, as well as new sites. Since surveys began in 1980, the number of occupied nesting territories has grown from 25 to over 70. Successful nesting has resulted in an increasing number of young eagles during each of the past few years. Montana boasts an average brood size of nearly two eaglets per nest, the highest in the Pacific Northwest.

Bald Eagle Nesting

Bald eagle nesting habitat is somewhat predictable. Although exceptions occur, the majority of nest sites in Montana have the following characteristics:

- The nest is in a forest stand larger than three acres, with fairly open vegetative canopy cover.
- The nest is built in the top one-third of one of the tallest trees within the stand.
- An alternate nest may be found within the nesting territory.
- Eagles most often choose live trees for nesting; of those, ponderosa pine, Douglas-fir, and cottonwood are preferred. Eagles also use large snags (standing dead trees) of these species.
- Nests are within one mile and line of sight of a large river or a lake at least 80 acres in size.
- The nesting territory of one pair may include 10 or more miles of river or lake shoreline.
- New nests are built or old nests repaired during fall and late winter.
- Territories and nests are used repeatedly; some have been used for over 80 years. Territories may be reoccupied after many years of disuse.

Wintering

Although some nesting pairs remain in the state year-round, the winter population is supplemented by migrants from Canada. Most bald eagles spend the winter along major rivers feeding on fish and waterfowl, but others feed on carrion, jackrabbits, and other small mammals found on the open prairies bordering the rivers. Deer killed by vehicles along some Montana highways attract bald eagles. Spawning fish, big game carrion on winter ranges, and, occasionally, afterbirth left on calving grounds concentrates larger numbers of eagles at particular sites. The number of bald eagles observed during the annual mid-winter statewide survey has ranged from 350-650 birds.

Perch and Roost Sites

Bald eagles use perches during the day while hunting, feeding, or resting. One or more eagles sometimes use the same perch site throughout the year. Perches are usually in large trees with horizontal branches which allow a commanding view of the area or are adjacent to feeding sites. Roosts are used at night or for protection during bad weather and may be occupied by one to several hundred bald eagles. Bald eagles usually fly to roost sites at dusk and leave before sunrise. Roost sites consist of old-growth trees in an area which provides protection from cold, freedom from disturbance, and proximity to food. Roost sites, like nest sites, are often used year after year.

Living with Bald Eagles

Bald eagles need secure places to rest and raise young, undisturbed feeding areas, and suitable winter habitat. Whether property contains woodland, farmland, or wetlands, and whether it is managed for farming, timber production, or hunting, conservation and enhancement of bald eagle habitat can be part of overall land-use planning.

Once bald eagles are discovered using an area, or if property could potentially provide valuable eagle habitat, there are some guidelines for managing land with eagles in mind. Since each nest, roost, and feeding site has unique qualities, it's probably advisable to contact a member of the MBEWG for specific recommendations. In developing a land-management plan, cooperative land-use agreements are sometimes useful for integrating habitat considerations into the design. Members of the MBEWG and state and private organizations providing this service are listed at the end of this article.

Degradation and loss of habitat are the most severe problems affecting bald eagles in Montana. If improperly planned or constructed, river impoundment, timber harvest, road construction, and subdivision development near nesting and wintering areas can hinder the conservation of bald eagles and their habitat.

Human-related bald eagle deaths occur in Montana, as well as nationwide. Eagles have been killed by shooting, accidental trapping, poisoning, electrocution, and collision with power lines and moving vehicles. In recent years, new laws and an enlightened public have significantly reduced the incidence of human-caused mortality. The following guidelines can help reduce accidental deaths of bald eagles:

- Use strychnine and other predator-control substances after eagle migration, approximately April 20, in areas where migrating eagles feed. Do not use these pesticides where nesting eagles feed.
- Avoid using exposed bait for trapping.
- Notify the Montana Department of Highways or a local game warden to remove carrion from highways and deposit it where eagles may feed undisturbed.
- Construct power lines away from nest sites and migration corridors.
- Modify power poles with perches that minimize risk of electrocution.

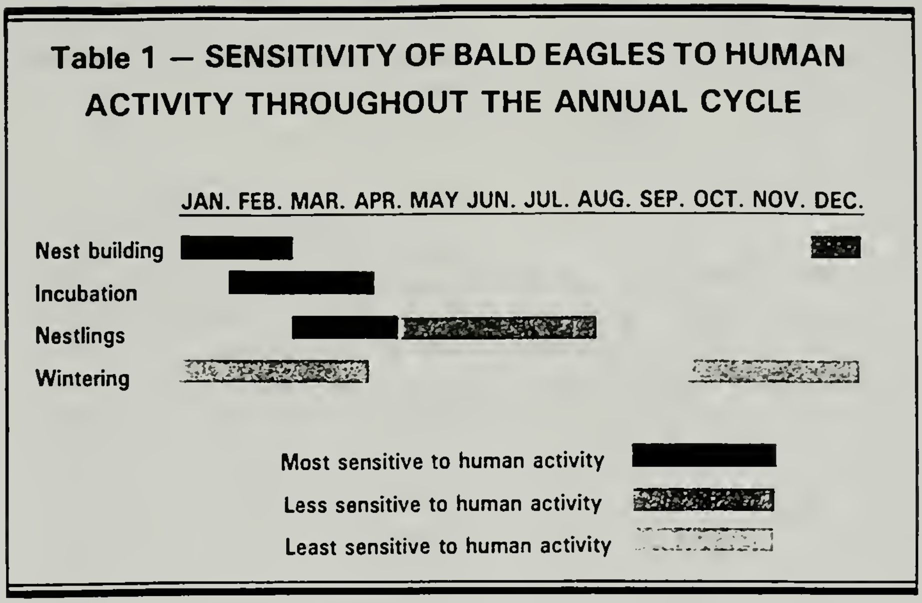


Table 1 — SENSITIVITY OF BALD EAGLES TO HUMAN ACTIVITY THROUGHOUT THE ANNUAL CYCLE

Bald Eagles and Human Activity

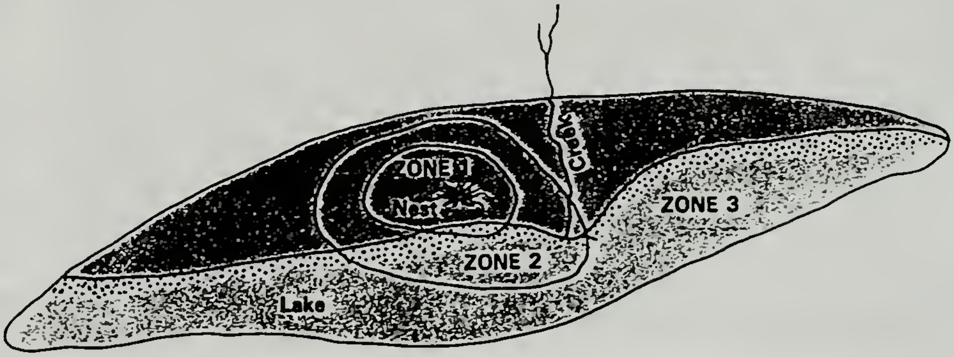
Human presence can disturb and at least temporarily displace bald eagles. Displacement during the nesting season can cause adults to change nest sites, abandon the nesting attempt for that year, or allow eggs to become chilled so they fail to hatch. People walking below the nest, boaters stopping near the nest, snowmobiling, blasting, shooting, tree-cutting, and operating loud equipment nearby can disturb bald eagles during the nesting season. Eagles gradually become more tenacious after the young have hatched and are less likely to abandon the nest site during the latter part of the nesting period. Many of these same activities prevent eagles from using perching and roosting areas.

Management Zones

Bald eagle managers have developed recommended management zones to define the space and privacy required by a nesting pair. If these zones were symmetrical, they could be drawn as a target with the nest at the bull's eye and with 1/4- to 2 1/2-mile-wide concentric rings around it. The zones within the home range are ultimately determined by observation of bald eagle use in the area. Size and shape of the zones may be influenced by topography and vegetation, as well as food sources.

- Zone 1—Nest site zone. An area of about 1/4-mile radius around the nest.
- Zone 2—Primary use area. An area of about 1/2-mile radius around the nest.
- Zone 3—Home range. All potential foraging habitat within 2 1/2 miles of the nest site.

Bald eagles can live with man's activities if land management considers the eagles' needs. Appropriate timing and location of activities such as farming, logging, construction, and recreation can be essential to nesting success. A pair of bald eagles may become accustomed to a tractor working in a field near the nest site or may tolerate



traffic moving along a nearby road. However, the eagles may become disturbed during the most sensitive part of the reproductive period (courtship through incubation) if human activities intensify, become unpredictable, or come too close to the nest site or feeding area. The dates in Table 2 correlate with Table 1.

Potential Nesting Habitat

Bald eagle researchers and resource managers estimate that Montana could support nearly twice the current number of nesting pairs. Management of potential nesting habitat is an integral part of the attempt to bring bald eagles up to a population and productivity level at which they are no longer considered threatened or endangered. Potential nesting habitat is defined as an area meeting most of the criteria which bald eagle nest sites have in common. Manipulation of the habitat or prey base may be necessary to make the potential site more attractive to bald eagles.

As the species gradually recovers from effects of past environmental abuses, more and more Americans will have an opportunity to see and appreciate this remarkable bird. A partnership of Montana citizens interested in responsible stewardship of land and waters will help ensure that the American bald eagle continues to fill its niche in nature.

Voluntary Landowner Protection

Interested private landowners can enter into cooperative programs with state or federal agencies to help protect nesting eagles. The Nature Conservancy, a private non-profit organization, also offers cooperative agreements. These "Registry Agreements" are not legally binding, but they acknowledge and encourage the important role of the private landowner in conservation. Consulting is provided at no cost for intended land-use changes which may affect bald eagles. The Nature Conservancy also offers assistance in locating a conservation buyer if a landowner is interested in selling property with valuable wildlife habitat. The Conservancy has natural area signs for posting registry sites which require landowner permission for access.

Granting a conservation easement, selling, or donating property to protect bald eagle nesting habitat may provide the private landowner with state and federal tax advantages. The following agencies and organizations can assist with these cooperative programs:

- The Nature Conservancy, P.O. Box 258; Helena, MT 59624 (406/443-0303;
- Montana Department of Fish, Wildlife & Parks, 1420 East Sixth Avenue; Helena, MT 59620 (406/444-2535);
- Montana Land Reliance, P.O. Box 355; Helena, MT 59624 (406/443-7027);
- Flathead Land Trust, 15 Depot Loop; Kalispell, MT 59901 (406/752-8293).

Contacts for the Montana Bald Eagle Working Group include:

- Dennis Flath, Montana Department of Fish, Wildlife & Parks; 1400 South 19th; Bozeman, MT 59717-0001 (406/994-6354);
- Rob Hazlewood, U.S. Fish and Wildlife Service, Federal Building, U.S. Courthouse, 301 South Park; Helena, MT 59626 (406/449-5225).

* * * * *

- *Other authors of this article include Dave Lange, Columbia Falls; Dale Becker, Polson; and Joan Bird, Helena. Other contributors and members of the Montana Bald Eagle Working Group include: Ron Escano, Atlanta; Dennis Flath and Al Harmata, Bozeman; Glen Gray, Swan Lake; Rob Hazlewood, Helena; Lorin Hicks, Seattle; Dan Hinkley, Billings; Reuel Jansen and Pat and Riley McClelland, Missoula; and Robert Klaver, Portland.*

SUGGESTED READING

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Harmata, A.R., J.E. Toepfer, and S.M. Gerard, "The Fall Migration of Bald Eagles Produced in Northern Saskatchewan," *Blue Jay*, Vol. 43, pp. 52-60, 1985.

Flath, Dennis and Rob Hazlewood, "Up, Up, and Away—Montana's Soaring Eagles," *Montana Outdoors*, Vol. 17, No. 3, pp. 2-5, 1986.

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McClelland, Riley, "McDonald Creek's Bald Eagles: An International Resource," *Montana Outdoors*, Vol. 13, No. 6, pp. 2-6, 1982.

Stalmaster, M.V., "The Bald Eagle," Universe Books, 1987.

Terres, John K., "Audubon Society Encyclopedia of North American Birds," Alfred A. Knopf, Inc., New York, 477 pages, 1980.

Marler, S., "Bald Eagles and Poaching: Threat to an American Symbol," *Western Wildlands*, Vol. 11, No. 4, pp. 2-6, 1986. ■

Table 2 — SUGGESTED TIMING OF ACTIVITIES WITHIN MANAGEMENT ZONES

	Dec. 1-May 1	May 1-Aug. 15	Aug. 15-Dec. 1
Livestock grazing	Zone 1,2,3	Zone 1,2,3	Zone 1,2,3
Low intensity activities, such as dispersed recreation, out of nest sight	Zone 3	Zone 2,3	Zone 1,2,3
Farming — cultivating, planting	Zone 3	Zone 2,3	Zone 1,2,3
Use of buildings within the territory	Zone 3	Zone 2,3	Zone 1,2,3
Pesticide use that is safe for eagles and their prey	—	Zone 2,3	Zone 1,2,3
Land alterations to maintain or improve nesting habitat	—	Zone 3	Zone 1,2,3
Habitat changes which do not adversely affect foraging area	—	Zone 3	Zone 1,2,3
Management to maintain prey base	—	Zone 3	Zone 1,2,3
Hunting, trapping (during legal season)	—	—	Zone 1,2,3

(Reprinted from the July/August 1989 Montana Outdoors, the official publication of the Montana Dept. of Fish, Wildlife and Parks.)

APPENDIX G

MONITORING SILENE SPALDINGII ON WILD HORSE ISLAND: 1991 PROGRESS REPORT

Introduction

Passage of the Federal Endangered Species Act of 1973 and subsequent recognition of the value of conserving biotic diversity (Wilson 1988) have resulted in many private and government agencies becoming active in species conservation. Surveys to determine the location and size of populations of rare species are being conducted throughout the west. These surveys are necessary in any species conservation program; however, knowing the location and size of populations at any one point in time is only the first step in a long-term protection strategy. (Sutter 1986). Extinction is a process requiring an understanding of population dynamics (Menges 1986). Periodic inventories can detect trends but will do little to determine causality or help generate predictive hypotheses (Palmer 1987). Long-term conservation requires a knowledge of many life history parameters including fecundity, recruitment, survivorship, age structure, and population flux. Demographic monitoring techniques can provide information on factors regulating population density and persistence (Palmer 1987). This information, in turn, provides an essential basis for management decisions.

Silene spaldingii Wats. (Caryophyllaceae) is a perennial herb, 20-40 cm tall, with viscid foliage. Flowers are 1-2 cm long with white petals that are mostly concealed by the green calyx. Three to twenty flowers are borne at the top of the stem in a sparingly branched inflorescence. The tiny seeds require stratification, so germination occurs mainly in the spring. Rosettes are formed the first year, and flowering may occur any time during or after the second season. Plants in Montana bloom in mid-July, and most fruits are mature by early to mid-August.

Silene spaldingii occurs sporadically in mesic grasslands of eastern Washington, adjacent Oregon and Idaho, and northwest Montana. The bulk of its habitat has been lost to agriculture and livestock grazing. All but five of 41 known populations are less than 100 plants, and the majority are fewer than 30 plants (Schassberger 1988, Lorain 1991). Existing populations are threatened by livestock grazing, road construction, herbicide treatment and exotic weed encroachment (Schassberger 1988, Lorain 1991). Silene spaldingii is listed as threatened in every state in which it occurs (Lesica and Shelly 1991), and it is a candidate for listing as a threatened or endangered species (C-2) by the U.S. Fish and Wildlife Service (USDI-FWS 1990). Silene spaldingii occurs at five sites in Montana, among these is Wild Horse Island State Park.

The purpose of this study is to track the condition of the S. spaldingii population on Wild Horse Island and to gather demographic information that will increase knowledge of the plant's life history.

Methods

On August 18, 1986 two permanent transects were established on Wild Horse Island to monitor Silene spaldingii (see Lesica 1986 for details on the location of the transects). Transects were read on 2 August 1988, 4 August 1989, and 5 August 1990 following methods outlined in Lesica (1987). Codes used in recording life history data are as follows:

S	Seedling	Only a basal rosette present
J	Juvenile	A non-reproductive individual with only sterile stems
I	Inflorescence	Records the number of flowering stems per mature individual
S	Sterile	Records the number of sterile stems per mature individual
P	Predated	Records the number of flowers suffering predation
A	Aborted	Records the number of unpredated flowers that did not produce a mature fruit
F	Fruit	Records the number of flowers that produced a mature fruit recognized by the presence of a large, swollen ovary

During the course of this study it became apparent that some non-reproductive plants had senesced early in the growing season and were not being included in the August census. As a result, in 1991 I conducted the census on 14 July. Consequently I believe that I obtained a more accurate estimate of the number of plants in the transects, but I was not able to count mature fruits or obtain an estimate of seeds per fruit. The following revised set of codes will be used in mapping at this earlier date:

Sm	Small	Only a rosette present
J	Juvenile	Only sterile stems present
--J	Unobserved	Presence unobserved one year but reappeared in subsequent years
S	Sterile	Number of sterile stems
P	Predated	Number of predated stems
I	Inflorescence	Number of flowering stems
F	Flowers	Total number of flowers per plant

A number of plants that were considered dead reappeared in subsequent years (Gilbert and Lee 1980). Thus, statistics presented in this report may differ from those reported previously.

Population growth rate was determined by the following formula:

$$\text{Population Growth} = \frac{\text{change in number of plants between year n and n+1}}{\text{number of plants in year n}}$$

Thus, population growth is negative when the population gets smaller and positive when it gets larger. Recruitment and death rates were determined by the following formulas:

$$\text{Recruitment Rate} = \frac{\text{number of deaths between year n and n+1}}{\text{number of plants in year n}}$$

$$\text{Death Rate} = \frac{\text{number of new plants in year n+1}}{\text{number of plants in year n}}$$

Results and Discussion

Since 1986 there has been a slow but steady decline in the number of plants in the belt transects (Table 1). Death rates have equaled or exceeded recruitment rates, and population growth has been negative (Table 1). These statistics are based on a sample of only 33 individuals (ca.10% of total population), so any conclusions must be interpreted with caution. Nonetheless, it does appear that the population is not flourishing.

During the five years that I have read these transects I have never observed a rosette (small size class) even though I have thoroughly searched for them. This suggests that small rosette-forming plants are dormant during the summer and cannot be detected by the current monitoring regimen. A second, but not mutally exclusive, hypothesis is that recruitment of seedlings is low in average years, and substantial recruitment occurs only in periodic flushes. The population growth data is in accord with this second hypothesis.

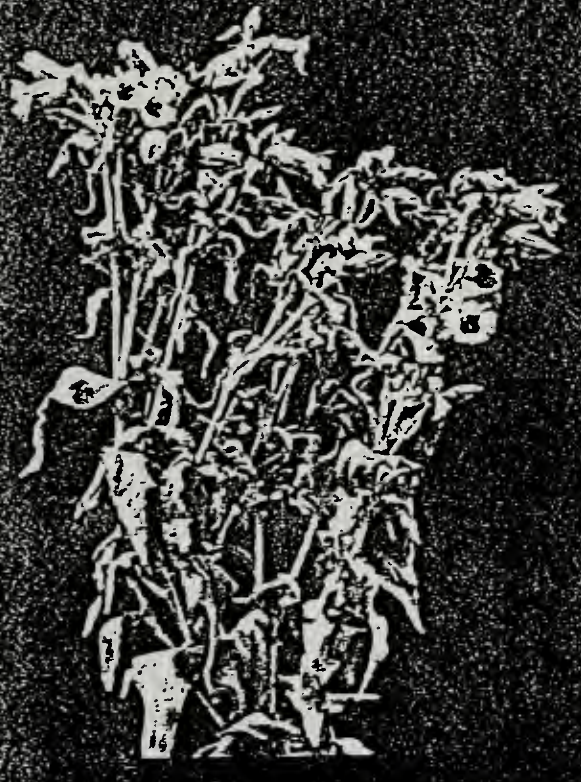
In 1991, nine of the 16 plants present were also present in 1986. Of the 23 plants recorded in 1986, nine (39%) were still alive in 1991. The median age of plants in 1991 was greater than six years old. These and the population growth data suggest that *Silene spaldingii* is a long-lived perennial with relatively stable population numbers. *Silene spaldingii* appears to have a K-strategy, slow population growth adapted to relatively competitive, stable communities (MacArthur and Wilson 1967). Substantial recruitment may depend on periodic disturbances such as heavy grazing or fire.

During the same period of time that population size was decreasing at Wild Horse Island, it was increasing at Dancing Prairie. This difference is due mainly to higher recruitment at Dancing Prairie (Table 1, Figure 1). Differences in recruitment could be due to ecological causes such as fewer germination "safe sites" at Wild Horse Island and/or reduced seedling viability resulting from inbreeding depression associated with the small population size at Wild Horse Island. Wild Horse Island does have deeper litter layers than Dancing Prairie that could reduce seedling survival. The population of S. spaldingii at Wild Horse Island is estimated to be 50 times smaller than that at Dancing Prairie, and this species does suffer appreciable losses from inbreeding depression (Lesica submitted). Thus both hypotheses seem plausible and are worthy of further study.

Yearly patterns of mortality and recruitment for the two sites are also quite different (Figure 1). In 1989 recruitment was highest at Dancing Prairie but lowest for Wild Horse Island. At Wild Horse Island mortality was high in 1991 but was low at Dancing Prairie. These two sites are 100 miles apart and may experience different climatic regimes. It seems likely that these different responses are due to an interaction of climate, local site factors and perhaps genetic differences.

SCIENTIFIC NAME: *Silene spaldingii*
COMMON NAME: Spalding's silene
FAMILY: Caryophyllaceae (Pink family)

This is one of the rarest species of plants in the northwestern United States. It has been seen by less than a dozen botanists. Spalding's silene has been found in the past at a few scattered localities in Washington, Idaho, and Montana. In Montana the species was observed in 1974 near Flathead Lake but has not been found since. It may already be extinct in Montana due to conversion of the habitat into farmland. The species is recognized by the short petals which are barely longer than the sepals.



Plant Species of Special Concern

United States Department of Agriculture
Forest Service
Northern Region

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APPENDIX H

DEPARTMENT OF STATE LANDS
FORESTRY DIVISION

TED SCHWINDEN GOVERNOR
2705 SPURGIN ROAD

STATE OF MONTANA

(406) 728-4300
MISSOULA, MONTANA 59801

September 9, 1985

949.5

Mr. Mike Baker
Parks and Recreation Division
Montana Department of Fish,
Wildlife, and Parks
490 N. Meridian
Kalispell, Montana 59901

Dear Mike:

I finally have some more information for you concerning the insect and disease problems on Wild Horse Island. The tip blight we observed infecting a large number of the ponderosa pines on our June 14 visit with you to the island has been identified as *Diplodia pinea* (Desm.) Kickx by pathologists with the U.S. Forest Service, Region One, here in Missoula. I have enclosed a leaflet which gives information about the damage and life cycle of the disease.

Damage from diplodia blight has a potential of being more severe than we had discussed, as trees that have been repeatedly infected may have some branches killed. Prolonged infections also reduce growth, deform trees, and may eventually kill them. However, I do not expect infections in the pines on the island to continue at such high levels as at present. Highly moist conditions are needed for infection. Large numbers of the spores by which the disease spreads are dispersed only during rainy periods, and high relative humidity is required for spores to germinate and grow. If there is little rain when the new shoots are susceptible, as was the case this spring and summer, infection levels are usually very low. An improvement in the condition of the trees should be apparent next summer.

As we discussed while we were on the island, some of the pines are also infected with another needle disease, *Elytroderma deformans* (Weir) Dark. This disease should not be considered a significant problem on the island, and infection levels will probably be less next summer, as it requires conditions similar to *Diplodia* for spread.

Mountain pine beetle, *Dendroctonus ponderosae* Hopkins, has killed a few small groups of ponderosa pine trees on the island also. Losses to this bark beetle may continue at present levels for another 2-3 years, but I would not expect it to kill large numbers of trees on the island.

If you need additional information or have questions, please contact me.

Sincerely,

Steve Kohler

STEVE KOHLER, Supervisor
Forest Insect & Disease Section
Assistance Bureau
Division of Forestry

SJK:emm

Enclosure

cc: Jim Byler
USDA, Forest Service, Missoula

Rolan Becker
Flathead Indian Agency
Box A
Pablo, MT 59855

Forest Insect
& Disease
Leaflet 161

U.S. Department
of Agriculture
Forest Service

Diplodia Blight of Pines

Glenn W. Peterson[1]

The fungus *Diplodia pinea* (Desm.) Kickx is most damaging to plantings of both exotic and native pine species in the United States. The fungus is seldom found in natural pine stands. *Diplodia pinea* kills current-year shoots, major branches, and ultimately entire trees. The effects of this disease are most severe in landscape, windbreak, and park plantings in the Central and Eastern United States.

Distribution

Diplodia pinea is known to occur in 30 Eastern and Central States and in Hawaii and California (fig. 1). The fungus infects more than 20 pine species. It is commonly found on Austrian pine, which, since the early 1900's, has been widely used in the Central and Eastern United States in landscape, windbreak, and park plantings. Damage by *D. pinea* is frequently reported on Scots (*P. sylvestris* L.), red (*P. resinosa* Ait.), ponderosa (*P. ponderosa* Laws.), and Mugo (*P. mugo* Turra) pines in the United States. *D. pinea* infects Monterey pine (*P. radiata* D. Don) in California and has seriously damaged extensive plantings of this species in the Southern Hemisphere (New Zealand, Australia, South Africa).

F-701801

Symptoms and Damage

The most conspicuous symptom of diplodia blight is brown, stunted new shoots with short, brown needles (fig. 2). Needles on infected new shoots often become

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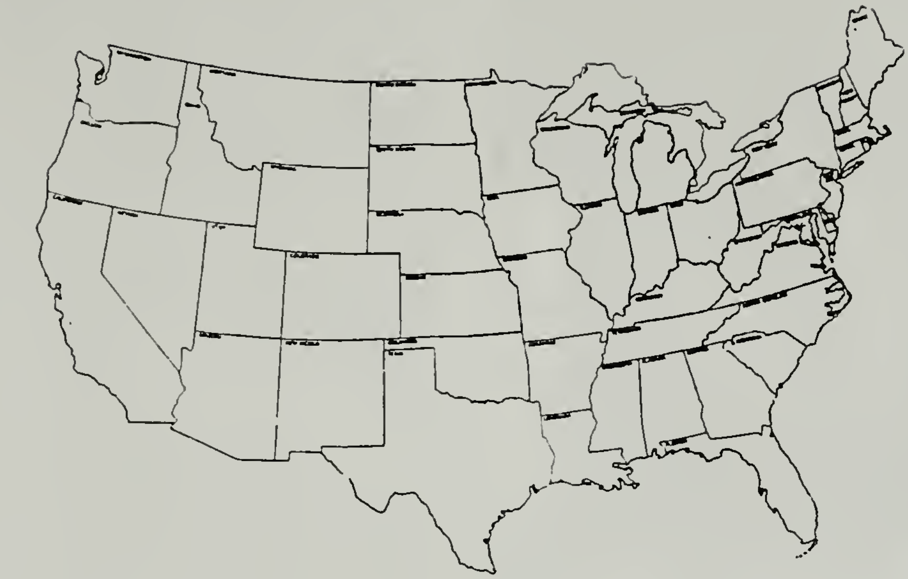
[1] Plant pathologist, Rocky Mountain Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, Lincoln, Nebr.



F-702090

Figure 1.—States in which *D. pinea* is present.

discolored (tan, brown) while still encased in fascicle sheaths. Presence of resin droplets and one or a few very short needles are usually the first indications that a new shoot is infected (fig. 3). Entire new shoots are killed rapidly by the fungus. Trees repeatedly infected have some branches killed back to the main stem. Repeated infections reduce growth, deform trees, and ultimately kill them.

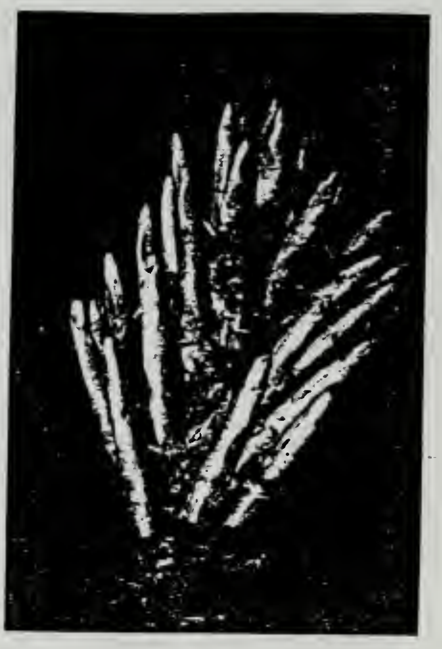
F-701803

Figure 2.—Infection of new shoots of Austrian pine.

New shoots throughout the crown may be infected, although damage is generally first evident in the lower crown. Usually infection varies considerably among major banches. Occasionally, after 2 or 3 successive years of infection, tree tops are extensively damaged (fig. 4).

Although pines of all ages are susceptible to *D. pinea*, damage is more severe in older plantings. In Great Plains windbreaks that were 20 to 22 years old, only a few pines were infected by *D. pinea;* but incidence and damage increased as the trees approached 30 years of age.

Damage may be confined to the new shoots, particularly on trees



F-701804

Figure 3.—Austrian pine shoot with early symptoms of diplodia blight; one very short needle with resin droplet.

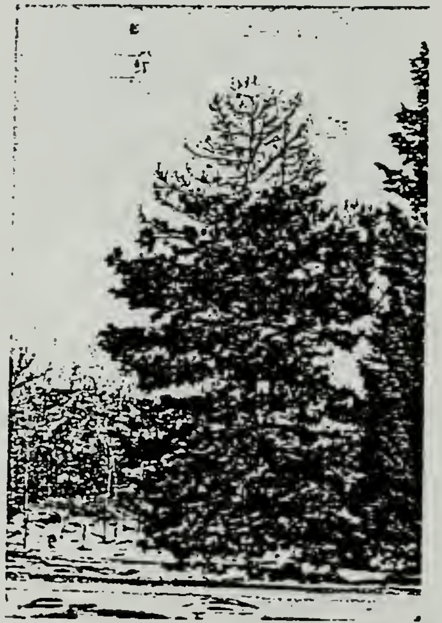
with shoots infected for the first time. The fungus will infect older stem tissues, but the way this occurs is not always evident. Commonly, when new shoots are killed, only a small percentage of the subtended stem tissue and second-year needles show evidence of infection. On severely damaged trees, however, the fungus usually can be isolated from all segments of major branches.

Although unwounded new shoots can be infected, *D. pinea* can infect both current-year and older tissues through wounds. In the Southern Hemisphere, *D. pinea* has often severely damaged trees wounded by hail. Also, damage by *D. pinea* has been associated with wounds made by insects. Tissues wounded during pruning or shearing operations may become infected. Wounded tissues remain vulnerable to *D. pinea* infection for several days. Stems of Austrian, Scots, and ponderosa pines wounded in May and late June were vulnerable to infection for at least 12 days after wounding.

Seed cones of Austrian, ponderosa, and Scots pines are susceptible to *D. pinea* their second year, but not the first.

Disease Cycle

Small, black fruiting bodies (pycnidia), in which *D. pinea* spores develop, form on needles, fascicle sheaths, scales of second-year seed cones, and bark. The fruiting bodies can be seen with a



F-701805

Figure 4.—Austrian pine with top killed by *D. pinea*.

10X hand lens. These black bodies, which erupt through the epidermis, usually are numerous at the base of needles (fig. 5) and on scales of second-year seed cones (fig. 6). Fruiting bodies are easily found on short needles of shoots infected the previous year, particularly on those that have turned ashen-gray and are easy to detach. When rainfall is above normal in late summer, unusually high numbers of pycnidia may develop on current-year needles and second-year cones. In most years, however, pycnidia are not numerous on these needles and cones until the following spring.

Spores are dispersed from March to October. The spores are transparent at first and later become brown (fig. 7). Accurate identification of the fungus is difficult because the genus *Diplodia* is described as having brown, one-septate spores; however, *D. pinea* pycnidia may yield many spores without any cross walls (septa). The percentage of spores with cross walls was very low (less than 1 percent) in pycnidia collected early and late in the growing season from fascicle sheaths, cone scales, and needles of Austrian and Scots pines in the Central United States.

Highly moist conditions are needed for infection. Large numbers of spores are dispersed only during rainy periods and high relative humidities are required for spores to germinate and for germ tubes to grow and penetrate needles and shoots. If there is little rain when new shoots are highly susceptible, infection levels usually are very low. Once the fungus penetrates needles, tissues are rapidly destroyed, resulting in stunted shoots and needles.

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Figure 5.—Pycnidia of *D. pinea* erupting through epidermis at needle base.

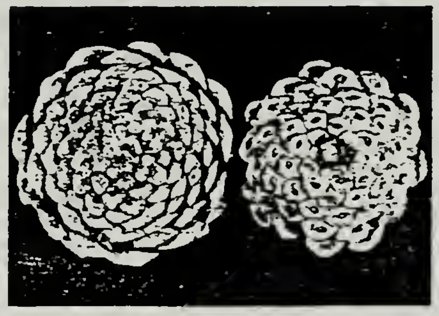

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Figure 6.—Pycnidia of *D. pinea* on cone (left); noninfected cone (right).

New shoots of Austrian, ponderosa, and Scots pines are most susceptible during a 2-week period starting when buds begin to open and continue to be susceptible until about mid-June. Growth of new shoots, needles, and seed cones with respect to the period of high susceptibility is shown in figure 8. Symptoms on new shoots can readily be detected in late May; extent of infection can be effectively determined in late June or July.

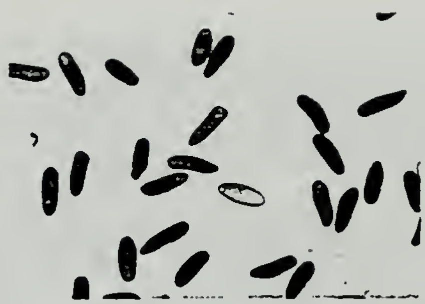

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Figure 7.—Spores of *D. pinea*.

Second-year seed cones are initially infected in late May. Numerous fruiting bodies develop on infected second-year cones and the increased damage to older trees is probably related to this fungus buildup. Infected seed cones often are observed on otherwise healthy pines, which indicates that, on older pines, inoculum builds up on seed cones before new shoots are extensively infected.

Control

Infection of new shoots can be reduced significantly by applying fungicide to pines during the 2-week period when shoots are highly susceptible to infection. This period, approximately from April 24 to May 8 in eastern Nebraska for example, begins with the opening of buds. During this short period, two applications of 4-4-50 Bordeaux mixture [4 lb. (1.8 kg) copper sulfate, 4 lb. (1.8 kg) hydrated lime, and 50 gal. (189 l) water] approximately 1 week apart are more effective than one application.

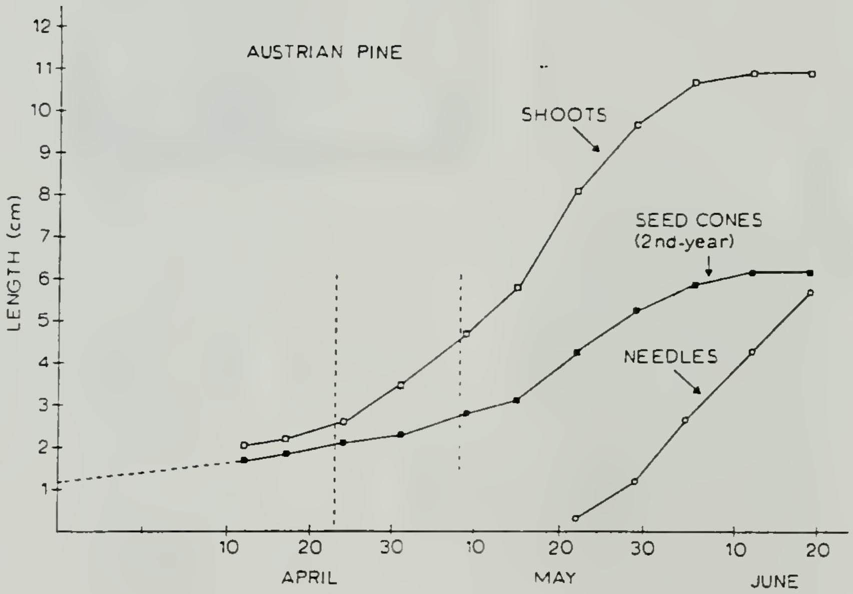

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Figure 8.—Growth of shoots, needles, and seed cones of Austrian pine in relation to period of high susceptibility (broken vertical lines) of new shoots to *D. pinea* in eastern Nebraska.

Fungicide applied during late April and early May to protect new shoots does not prevent infection of seed cones. Thus it would probably not be practical to try to reduce inoculum (spores) on seed cones with protective fungicides, since one or more additional fungicide applications would be required. Removal of infected branches may be justified on the basis of improving tree appearance, but this procedure probably would not reduce the amount of infection significantly.

Pruning or shearing in Christmas tree or other pine plantings should be avoided during periods when conditions are highly favorable for infection because of danger of infection through wounds.

Pine seedlings in nursery beds usually become infected where beds are located near old, cone-bearing pines. The old infected pines should be removed or pine seedling beds should not be located near such pines. Infected new shoots have been observed on young (10- to 15-year-old) pines in plantings adjacent to older pines whose seed cones contained numerous fruiting bodies and spores of *D. pinea.* Diplodia damage can be reduced if new plantings are not made in the vicinity of older cone-bearing pines.

Caution: Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed. Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or when they may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first-aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump or crush and bury them in a level, isolated place.

Note: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the Environmental Protection Agency, consult your county agricultural agent or State extension specialist to be sure the intended use is still registered.

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Elytroderma Disease of Ponderosa Pine

T. W. Childs,[1] Keith R. Shea,[2] and James L. Stewart [3]

The most important needle disease of ponderosa pine in the Pacific Northwest and parts of adjacent regions is caused by a native fungus, *Elytroderma deformans.* This disease also occurs on Jeffrey pine and occasionally on other pines.

Damage varies greatly in severity from place to place and from time to time. It is usually slight or moderate, even where the disease is common; but stands in widely separated localities are sometimes badly damaged during outbreak periods. Although some mortality results, especially during severe outbreaks, the greatest impact is on growth.

Description

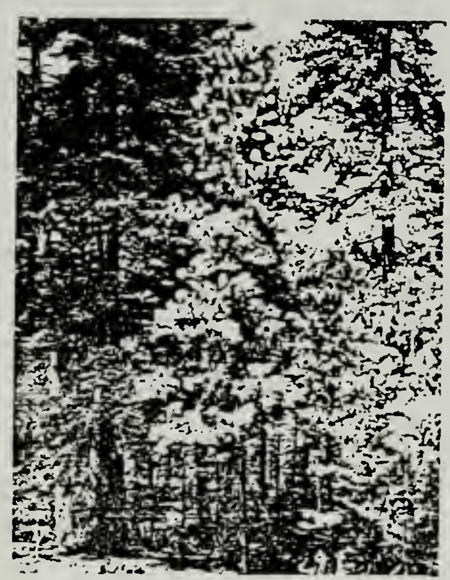

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Figure 1.—Elytroderma disease is concentrated in the lower crown of this pole-size ponderosa pine. Foliage "flags," normally reddish-brown, appear white in the photograph.

The most prominent features of Elytroderma disease are the red-brown "flags," which appear in spring (fig. 1). Infected needles are reddish brown during spring and early summer of their second year. These needles gradually fade and become partially obscured by new foliage until, in late summer, it is difficult to distinguish them at a distance from old needles

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[1] Forest pathologist (retired), USDA Forest Service.

[2] Forest pathologist, Pacific Northwest Forest and Range Experiment Station, USDA Forest Service.

[3] Forest pathologist, Region 6, USDA Forest Service.

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that fade prior to normal fall defoliation.

The characteristic long, dark, slender fruiting bodies of the fungus (fig. 2) first appear in the spring as faint lines on the convex (outer) surfaces of the red needles. By late spring or early summer, the fruiting bodies are plainly visible, but they may be small and sparse when needle vigor is poor. These lines of fruiting bodies readily distinguish this disease from other foliage diseases. Spores mature in late summer and fall and are ejected when the needles are wet. Most of the infected needles fall during the winter, but a few old bleached needles with sooty, ragged remnants of fruiting bodies still visible sometimes remain attached.

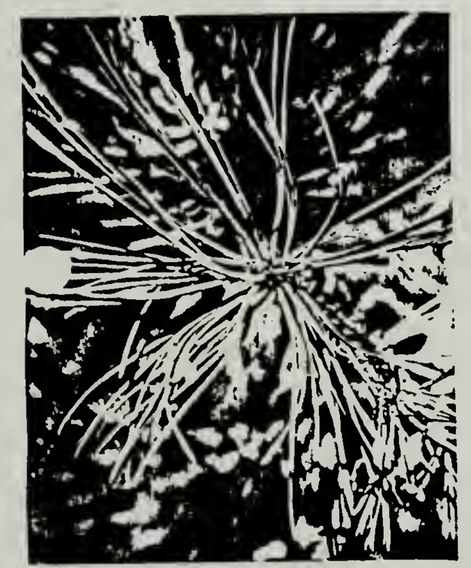
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Figure 2.—Infected ponderosa pine needles, showing dark, slender fruiting bodies of the fungus *Elytroderma deformans*.

Vigorous infected branches on thrifty trees often develop into globose, but sometimes irregular, witches'-brooms (fig. 3), which are denser and more rounded than those caused by dwarf mistletoe. Twigs once flagged usually will flag again each spring and soon curve upward (fig. 3).

The fungus is perennial, as vegetative mycelia, in the inner bark of infected branches. When the inner bark is exposed, characteristic lesions (fig. 4) are plainly visible on branch segments from 2 to 12 years old. In saplings, at least, lesions may occur in adjacent parts of the trunk and in the bases of unflagged adjacent branch whorls. On small stems invaded by Elytroderma, branches soon becomes noticeably flagged because of vegetative spread of the fungus. Because the fungus can live from year to year in invaded bark, the disease can be perpetuated without conditions favorable for spore infections of new needles.

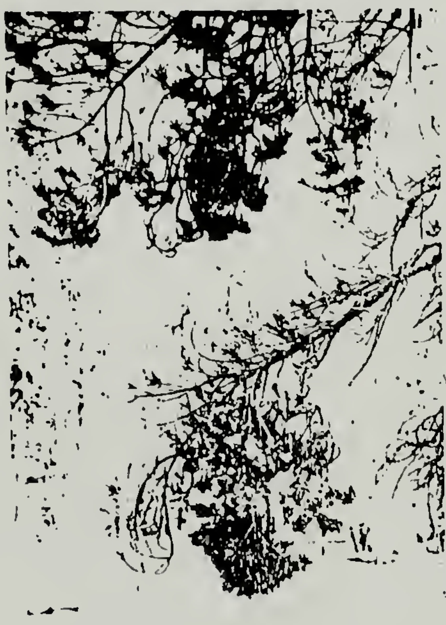
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Figure 3.—Witches'-brooms and upward-curved twigs caused by Elytroderma disease on ponderosa pine.

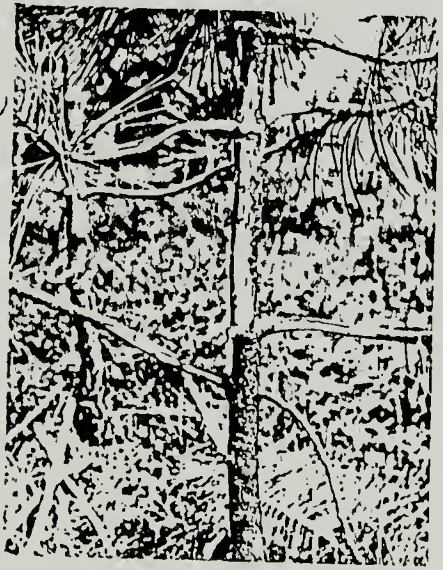
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Figure 4.—Brown, necrotic lesions characteristic of Elytroderma disease occur in the bark of infected branches and stems.

Relation to Environment

Blight spread and intensification probably depend on climatic conditions favoring spore infection. Since dry spores cannot germinate, pine foliage must be wet and temperatures must be favorable when living spores are being dispersed. Local outbreaks characteristically start in sheltered situations, such as bottoms of draws. They may also occur along edges of meadows, or less frequently on middle and upper slopes where moisture is available from heavy dews, frequent or persistent fogs, and condensation in ascending air currents. Infection by spores is invariably more severe in shaded thickets of reproduction, in the interiors of groups of pole-size trees, and on the lower crowns and north to northwest sides of pole-size and larger trees.

Except for very general moisture and temperature relationships, little is known about the conditions determining disease prevalence. Some infection of needles by spores may occur every year, especially during wet cycles; but damaging intensities result only when conditions are exceptionally favorable. Once established, however, vegetative spread of the fungus in the inner bark perpetuates the disease until conditions are again favorable for additional new infections by spores. Infection intensities tend to be highest in stands of moderate overstory density and at elevations intermediate in the altitudinal range of ponderosa pine. In central and eastern Oregon, infection is most severe at about 5,000 feet above sea level, presumably because lower elevations are too dry and higher elevations too cold.

Effect

Damage by the disease is often overestimated because of the great contrast between blighted and healthy foliage in the spring. Blight is most injurious to trees with poor crowns, although it is most conspicuous in good crowns. When the proportion of blighted foliage is low, damage is slight although the flags may be conspicuous.

When infection of mature trees has been moderately severe (fig. 5), crowns gradually become thin, ragged, or short, and trees are correspondingly reduced in vigor. Rapid and direct killing by blight is infrequent in such stands, and most of the trees survive for at least several years. However, mortality gradually increases as weakened trees are attacked by bark beetles, root rots, or other enemies.

F-520237

gure 5.—Ponderosa pines with crowns thinned by Elytroderma disease. Several other diseases cause similar thinning of crowns.

When infection of mature trees has been severe for 2 or 3 years, the foliage consists principally of needles produced during the preceding spring. These needles are usually stunted and pale and die shortly before the new needles appear the next spring. Such trees often die as a direct result of almost complete defoliation. Mortality from defoliation is common only in a few locations. On these locations most trees on areas up to 100 acres or more may be affected. Severely infected trees, however, seldom are attacked by bark beetles.

The probable consequences of the disease on individual overstory trees of average vigor can be roughly forecast as follows: *Needles diseased on less than one-fourth of the twigs*—little or no injury; *needles diseased on one-fourth to three-fourths of the twigs*—host weakened and more likely to be killed by bark beetles or other parasites; *needles diseased on more than three-fourths of the twigs*—host likely to die soon as a direct result of defoliation. Large increases in infection severity are infrequent; but when they do occur, they usually develop rapidly and have culminated by the time they are noticed.

Recovery of mature trees appears to be a very slow process and may be more apparent than real because the flags disappear as affected twigs die, but lost foliage is replaced to only a small extent by growth elsewhere in the crown.

Killing and deforming in smaller size classes are usually restricted to crowded or suppressed trees of little value. Although lower branches or even entire lower crowns are often killed on vigorous young trees, the upper crowns of such trees usually are affected only slightly; and foliage losses are soon recovered by new growth at the tops.

Control

Elytroderma disease is too important to be ignored. Its importance sometimes has been overrated because of its sudden and alarming appearance; but, like other destructive agents, the disease merits the foresters' attention. The foresters must rely on personal judgment in deciding how much weight to give the disease in management plans. Evaluations should be made in spring or early summer when infection is most apparent. Damage can be reduced by maintaining thrifty young stands and salvaging threatened mature trees before they die. The following practices are recommended:

Young stands.—Where infection during past outbreaks has remained light, the disease is unlikely to cause serious damage in the future. At the other extreme, stagnated stands on or near former centers of outbreak are likely to be damaged by another outbreak before they mature.

To minimize damage:

1. Maintain good spacing. Infection is heaviest on crowded trees, and most injurious to slowly growing ones. Sometimes, large openings apparently create an environment favorable to spread by spores.

2. Select no trees for crop that are flagged within 3 feet of the leader and preferably none flagged within 6 feet. Infections near the leader often spread vegetatively to it, and small trees with infected leaders often develop into "coniferous brush."

3. Select uninfected or only lightly infected trees for crop. Flags visible during early stages of outbreak are a small fraction of those that eventually result from vegetative spread. Trunk infections often deform small trees.

4. Prune where economically justified. The majority of spore infections occur in the lower crown where they produce quantities of spores for further spread. The fungus may also spread vegetatively into the trunks and upward into the higher branches.

Mature stands.—Future outbreaks will undoubtedly cause some damage even in vigorous young-mature stands and more severe and rapid damage in decadent overmature stands. The problem is to save threatened trees without harming the remaining stand.

When the disease becomes conspicuous in mature stands:

1. Do not act hastily; proceed slowly. Serious damage will not occur for a few years. Although new flags in vigorous crowns are striking, they do not indicate greatly reduced growth or imminent mortality.

2. Evaluate each stand annually. Flags are easiest to see in spring and early summer. Assume that:

a. Flagged twigs will die in a few years.

b. Additional flagging will occur, probably more than twice as much as is visible during early outbreak stages.

c. Trees with half the twigs flagged or killed are likely to be attacked by bark beetles or root diseases.

d. Trees with more than three-fourths of the twigs flagged or killed are likely to die directly from the disease.

e. Trees with originally poor crowns will be damaged more rapidly and severely than equally infected trees with originally good crowns.

3. Give high priority to stands where appreciable damage is expected within the next few years; log immediately when mortality rates or bark beetle populations start to increase.

4. When logging selectively in lightly infected stands, remove the occasional tree with more than one-fourth of its twigs flagged or killed and, where feasible, remove the most heavily infected other trees.

5. When logging moderately to heavily infected stands, either cut drastically, leaving only trees with very good crowns and no more than a few scattered flags, or plan to relog within a year or so if necessary. Partial cuts in diseased stands usually are followed by rapid crown deterioration and high mortality of residuals.

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Forest Insect
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MOUNTAIN PINE BEETLE[1]

William F. McCambridge[2], Gene D. Amman[3], and Galen C. Trostle[4]

F-701452

Outbreaks of the mountain pine beetle, *Dendroctonus ponderosae* Hopkins, frequently develop in lodgepole pine forests that contain well-distributed, large diameter trees, or in dense stands of commercial-sized ponderosa pine (fig. 1). When outbreaks are extensive, one million or more trees may be killed each year. The periodic losses of high value, mature sugar pine and western white pine are less widespread but are still highly destructive.

Widespread tree mortality resulting from outbreaks of several years' duration can influence the ecosystem. Often, infestations will almost totally deplete merchantable pine forests and, in some cases, have converted valuable forests to less desirable timber species. Sometimes forested areas are converted to grasses and shrubs. In addition fire danger is increased because of excessive amounts of dry fuel in dead trees.

The mountain pine beetle is found over a wide area ranging from the Pacific Coast eastward through the Black Hills of South Dakota and from northern British Columbia and western Alberta southward to northwestern Mexico. Its habitat ranges in altitude from 2,000 feet (1600 m) in the more northern latitudes to 11,000 feet (3350 m) in southern California.

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[1] Coleoptera: Scolytidae.

[2] Entomologist, Rocky Mountain Forest and Range Experiment Station, U.S. Department of Agriculture Forest Service, Fort Collins, Colo. 80526.

[3] Entomologist, Intermountain Forest and Range Experiment Station, U.S. Department of Agriculture Forest Service, Ogden, Utah, 84401.

[4] Forester, Forest Insect and Disease Management. Pacific Northwest Region, U.S. Department of Agriculture Forest Service, Portland, Oreg. 97208

Hosts and Damage

In addition to the four major host trees (ponderosa, lodgepole, sugar, and white pines), the mountain pine beetle occasionally infests limber, Coulter, foxtail, whitebark, pinyon, and bristlecone pine. Scots pine, an exotic of North America, is highly susceptible to attack. Douglas-fir, true firs, spruce, and larch may occasionally be attacked, but they are not true hosts, and brood rarely develops. These attacks on nonhost trees usually occur when nearby pines are heavily infested.

F-701453

Figure 1.—*Destructive mountain pine beetle outbreak in ponderosa pine.*

The first signs of infestation are pitch tubes on the trunks of living trees. These pitch tubes appear during summer months, and mark the places where female beetles have entered the tree (fig. 2). Pitch tubes are cream-colored to dark red masses of resin, mixed with boring dust, and are 1/4 to 1/2 inch (6 to 13 mm) in diameter. Large tubes, 3/4 to 1 inch (19 to 25 mm), widely scattered over the trunk, may indicate that beetles failed to successfully invade the tree. Careful examination of trees that have been successfully attacked will reveal the second sign—dry boring dust (similar to fine sawdust) in bark crevices and around the tree base.

F-701454

Figure 2.—*Pitch tubes made by mountain pine beetles.*

One to several months after attack, bluestaining fungi that are carried into the trees by the beetles begin to discolor the sapwood.

Needles on successfully infested trees may start to fade and change color several months to almost a year after beetle attack. The sequence of color changes is green to yellowish green, then sorrel, and finally red and rusty brown (fig. 3). Fading in the top may be the first sign of attack on large sugar pines since initial infestation on such trees usually occurs high on the tree.

Woodpeckers, in their effort to reach larvae under the bark, make individual holes in thick bark trees, or they may partially or completely remove thinner bark. These signs, plus the resulting pile of bark flakes around the base of the tree, are good evidence of infestation.

F-701455

Figure 3.—*Trees killed by mountain pine beetles that attacked 1 year previously*

Life Stages and Development

Mountain pine beetles pass through the egg, larval, pupal, and adult stages during a typical life cycle of 1 year. All stages of the life cycle are spent under the bark of infested trees, except for a few days when adults emerge and fly to new trees.

At high elevations where summer temperatures are cool, 2 years may be required to complete the life cycle, and in California, two generations may be produced in 1 year in low elevation sugar pine.

The tiny, pearl-white eggs are laid along the sides of straight, vertical, frass-packed egg galleries constructed by the females (see cover). These galleries are mostly in the inner bark, but slight scoring of sapwood also occurs. When fully constructed, galleries will range from 6 to 30 inches long (15 to 70 cm).

Most eggs are laid in July and August, but a few are laid in the fall or early spring. The latter are generally due to egg gallery extension or parent reemergence and reattack. Usually the egg stage lasts 1 to 2 weeks.

Larvae feed on the inner bark (phloem), constructing galleries that extend at approximately right angles to the egg galleries. The legless larvae are white with tiny brown heads and will be found from August to the following June. When fully developed, larvae excavate oval cells inside of which they transform into pupae, then into adults (fig. 4). Prior to emergence, adults feed within the bark.

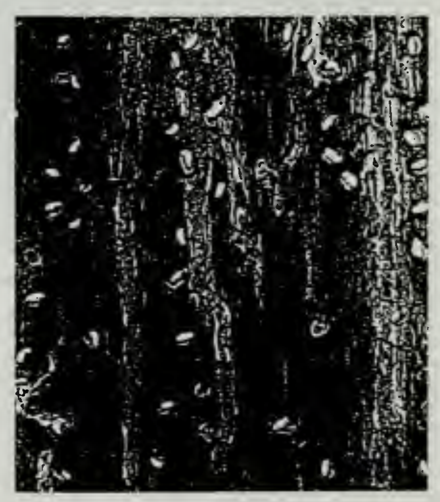
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Figure 4.—*Egg gallery, larvae, and pupae of 10-month-old mountain pine beetle brood.*

Several feeding chambers may coalesce so that adults assemble in groups of various numbers. One or more beetles will then make an exit hole from which several adults will emerge. Exit holes in the bark are very easily seen. Beetles will attack new trees within a day or two following emergence.

While adults are feeding in the inner bark prior to emergence, they pick up blue stain fungal spores in a special structure in their heads. Spores are carried to newly attacked trees where the fungi develop, eventually spreading throughout the sapwood (fig. 5). This hinders tree resistance to beetle attacks and makes moisture conditions under the bark more favorable for beetle development.

Unmated female beetles make the initial attacks and release odors, called aggregating pheromones, that attract males and other females until a mass attack is produced and the trees are overcome. Consequently, if beetle populations increase from year to year, the aggregating behavior results in larger and larger groups of trees becoming infested.

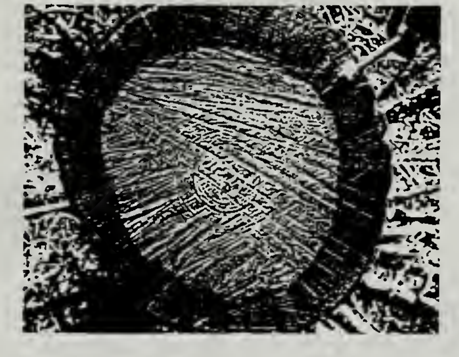

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Figure 5.—*Sapwood discolored by blue-stain fungi; heartwood is not stained.*

Initial attacks on most pine species occur at about eye level, and trees are usually killed by attacks of a single generation of beetles. Large sugar pines, in contrast, are attacked first in the crown, and two or three successive generations of beetles, each attacking a lower portion, may be required to kill the tree. Attacks on small sugar pine are similar to those on ponderosa and lodgepole pines.

Factors Affecting Outbreaks

There are a number of factors, seldom present alone, that contribute varying amounts of pressure on endemic and epidemic populations of beetles. Principal ones are:

Food Supply.—This is perhaps the key factor regulating populations of the mountain pine beetle. Through some survival mechanism, beetles frequently but not always select the larger trees, where food is likely to be most abundant. Adequate food, most likely found in large diameter trees during better than minimum moisture periods, remains a major requirement for infestation buildup. After larger trees are killed, beetles infest smaller and smaller trees, where phloem is thin. When this happens, beetle populations decline and epidemics subside. There is no clear-cut evidence that mountain pine beetle epidemics develop because of drought or in heavily mistletoe-infected stands. Sugar pine and white pine may be exceptions since drought or snowbreakage are believed to trigger epidemics.

Loss of attacking beetles.—This is due to beetles failing to reach a host tree or failure to initiate attack once on the tree. This loss is difficult to measure but is believed to be considerable at times.

Tree resistance.—Some pines produce so much pitch at the attack site, or in the egg gallery, that a brood cannot be established. The number of attacking beetles, health of the tree, and weather that prolongs the attack period are major factors that interact in tree resistance.

Nematodes.—These microscopic internal parasitic worms can reduce or prevent egg production in female beetles.

Birds.—Woodpeckers feed heavily on larvae in some trees, causing the bark to dry out which kills more beetles. Woodpeckers probably play an important role in reducing beetle numbers during endemic periods but there are not enough woodpeckers to control epidemics of the beetle. Several other species, including nuthatches, feed on beetles as they attack new trees.

Predaceous and parasitic insects.—A fly, *Medetera aldrichii* Wheeler, and two checkered beetles, *Enoclerus sphegeus* Fabricius (fig. 6) and *Thanasimus undatulus* Say, are common predators that may be very effective in reducing beetle numbers in individual trees but are seldom very effective in reducing mountain pine beetle infestations. A parasitic wasp, *Coeloides dendroctoni* Cushman, sometimes causes substantial larval mortality but only in trees with thin bark where its short ovipositor can reach the beetle larvae.

Competition.—Larvae compete for food and space not only with each other but with similar stages of other beetles. Larvae of round-headed woodborers (Cerambycids) occasionally destroy practically all mountain pine beetle broods under bark (fig. 7) as they devour everything in their vicinity.

Cold temperature.—Unseasonably low temperatures of about 0° F (-18° C) in early autumn or mid-spring, or those below -34° F (-37° C) (slightly lower for lodgepole pine) during winter months will greatly retard outbreaks. Unfortunately, such cold temperatures settle into low areas and some beetles survive where temperatures are not as severe, such as below the snow line, in thick-barked trees, and on slopes above the coldest temperature. These survivors form the nucleus for the continuation of existing or subsequent outbreaks.

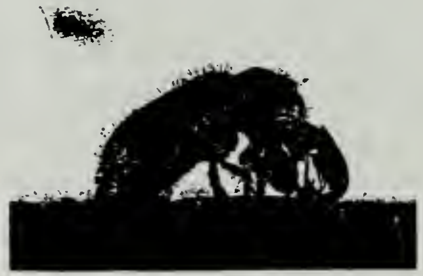

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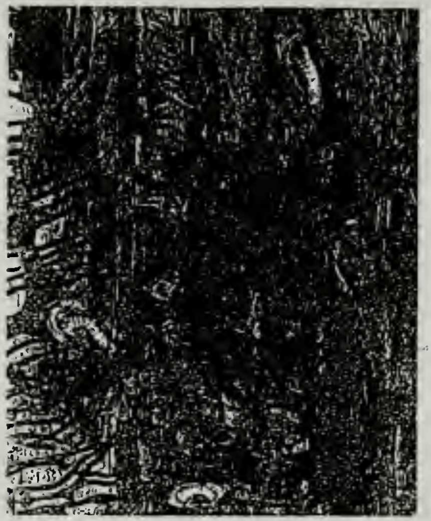
Figure 6.—*Redbellied clerid eating a mountain pine beetle.*



F-701459

Figure 7.—*Larvae of roundheaded woodborers have destroyed mountain pine beetle brood.*

Control

Control options available to the landowner depend somewhat on: size of the outbreak, age of the stand, size of the trees, and stand growing conditions. Generally, at about age 80 to 100 years, when tree diameters are 8 inches (20 cm) and larger and growth is beginning to slow due to competition, stand susceptibility increases. Phloem is still thick in large diameter trees, and ample brood can be produced.

Cultural control measures are the most efficient in these situations. Thinning dense stands of ponderosa pine to improve growth, or harvesting large diameter host trees, both ponderosa and lodgepole pine, lowers stand susceptibility and reduces beetle-caused mortality. Patch cutting in lodgepole pine stands creates a mosaic of age classes that keep mountain pine beetle-caused tree mortality low, and also provide openings that are beneficial to wildlife.

Once a large outbreak has developed it is very difficult to effectively carry out salvage logging of infested material to reduce future timber losses. Logging is always done after the beetles have attacked. Thought should be given to a combination of salvage, thinning valuable green stands, and removing large diameter trees in advance of the beetle attacks.

Chemical insecticides have been available for many years for direct control of beetles in infested trees. Direct control requires the combined efforts of all landowners within the designated control area, and treatment costs may exceed the wood product value of individual beetle-infested trees. Some landowners are unable or unwilling to spend the money needed for an effective program. When beetle outbreaks are large, cost effectiveness of direct chemical control may be hard to justify.

Individual, high value trees have been protected in recent years by the use of insecticides. Spraying trees of choice prior to beetle attack does not require united effort by forest landowners, nor is the value of the tree lost, as in direct chemical control.

Insecticides used for direct control or preventive sprays are reviewed periodically by the Environmental Protection Agency. Therefore, persons contemplating use of insecticides should obtain the names of materials currently registered for use. This information can be obtained from any of the following:

USDA, Forest Service, Forest Insect and Disease Management

P.O. Box 2417
Washington, DC 20013

11177 W. 8th Avenue
Box 25127
Lakewood, CO 80225

Federal Bldg.
324 25th St.
Ogden, UT 84401

319 SW Pine St.
P.O. Box 3623
Portland, OR 97208

Federal Bldg.
Missoula, MT 59801

Federal Bldg.
517 Gold Ave., SW
Albuquerque, NM 87102

530 Sansome St.
San Francisco, CA 94111

or by writing to the local Extension Service, or to your State College or University.

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APPENDIX I

WEED MANAGEMENT SUGGESTIONS FOR WILD HORSE ISLAND ON FLATHEAD LAKE

Submitted to:

Jerry Sawyer
Department of Fish, Wildlife, and Parks
490 North Meridian Road
Kalispell, MT 59901

by

Dr. Pete Fay
Extension Weed Scientist
Department of Plant and Soil Science
Montana State University
Bozeman, MT 59717-0312

and

John Halpop
M.S. Range Science
County Extension Agent
Thompson Falls, MT

October 15, 1993

INTRODUCTION

Wild Horse Island is the largest island in Flathead Lake covering approximately 2100 acres. It was owned by the McDonald Family who donated their portion of the island to the Nature Conservancy. The Island is now under the control of the Montana Department of Fish, Wildlife, and Parks (FWP).

The island is designated a "Primitive area." No overnight camping or motor vehicle use is permitted. The island is heavily visited during the summer by boaters. It is a popular hiking spot, primarily because of the abundant wildlife. The wildlife population is approximately 325 bighorn sheep, 100 mule deer, and 5 horses. Other wildlife include bald eagles and occasional migrating bears and coyotes who come to the island on the ice. We also observed several badger holes.

There are 50 private lots on the island with 26 or 27 cabins. One building, the Hiawatha Lodge, has a colorful history. It is in an advanced state of deterioration at this time. Local folklore includes a story about a visit to the lodge by Al Capone during the prohibition period. We visited one site which contained several old farm buildings from a homestead (circa 1910) and an old apple and pear orchard ladened with fruit. The information above was provided to us by Sawyer and Phillips.

BACKGROUND

Greg Bennett, Weed Supervisor, Lake County, was asked by Mike Hutchins, County Commissioner, Lake County, to arrange a tour of Wild Horse Island to assess the weed situation. Greg contacted Pete Fay and John Halpop for assistance. The tour of the island occurred on September 14, 1993, led by Jerry Sawyer and Merle Phillips from the Kalispell office of the Department of Fish, Wildlife, and Parks. The other participants were Greg Bennett, Mike Hutchins, Fay, and Halpop.

Hutchins was concerned because of the increased use of Wild Horse Island by people and the weeds they tend to accidently bring with them. He knows the island well and also knows the Dept. of FWP is underfunded and understaffed. His goal was to assess the present weed situation and, if needed, prepare a weed and range management program. He is to be commended for his concern and leadership in requesting this effort.

THE APPROACH

We travelled by ATV and "mule" (both four wheel drive vehicles) around the island. Sawyer and Phillips visit the island numerous times each year so they took us to known weed infestations. Our observations and suggestions follow:

Ponderosa Pine Encroachment

We repeatedly saw young ponderosa pine trees growing in draws in lush, tall, ungrazed grass. The trees appeared to represent sporadic flushes because each stand contained trees of various but distinct ages. At first glance there were no "small" trees (1-3 years old). Most were 2-3 feet, 5-8 feet tall. Later we observed hundreds of seedlings 1-2" tall, which germinated this spring. This flush was, most likely, a response to the wet year and will represent the favorable conditions of this season for years to come.

There is no doubt that ponderosa pine is increasing rapidly and will dominate the grassland areas in time. The presence of private cabins on the island perimeter prevents the use of the natural control method, fire. This means that control measures, if desired, will be restricted to mechanical, cultural, or chemical methods.

Mechanical Control -- Trees could be removed by cutting. A given draw could be cleared once every ten years. If all the affected draws on the island were numbered, a small crew could do 10% of the draws per year in several man days. The number of draws to be maintained could be determined by priority so that only the widest, most accessible draws were maintained as grasslands.

Suggested tools for mechanical removal of ponderosa pine trees:

Machetes can be used effectively for trees to a stem diameter of one inch. Shin guards similar to those used by baseball catchers are recommended to prevent leg accidents. Leather gauntlet-type gloves should be worn to protect hands and forearms.

"Loppers" with long handles approximately 2 feet long and short scissor-type blades approximately 3" long can be used effectively to cut trees with a stem diameter up to 2". Loppers are safer than machetes but slower.

There are "weed eaters" equipped with saw blades. New models are being developed which are push types like lawn mowers which are much safer to use than the shouldered models. Some are self propelled which would facilitate uphill movement. Trees could be cut several inches from the soil surface and no regrowth would occur due to the absence of meristem on the cut stem.

Cultural Control. The most cost effective method of control is the use of fire. There are fire specialists who claim expertise in this field. They could be consulted for advise on the feasibility of safe, risk-free burning.

Once the older trees were removed, machetes could be used for younger, small diameter trees in years to come. Cut trees could be piled or left in place since decomposition occurs rapidly.

Chemical Control -- The following herbicides effectively control ponderosa pine and do not effect perennial grasses if used at proper rates of application:

Access
Crossbow
Envert 171
Weedone CB
Garlon

Lever operated backpack sprayers could be used effectively by well-trained crews to eliminate small (1-3') trees. The sprayers could be equipped with large output nozzles so the spray solution could be directed on each tree. Agricultural spray dye should be added to the spray solution to prevent crews from making spray skips and double applications.

A control technique used by ranchers in the past involves the use of pasture rollers. Tractor-drawn rollers are driven over ponderosa pine trees when temperatures are below -25°F. This snaps the brittle trees off at ground level and is reported to work well (John Lacey, Personal Communication). This technique does not seem feasible for this problem but is worth mentioning.

Do Nothing -- Ponderosa pine is a native species and the encroachment represents a man-made phenomenon centering around the prevention of fire. Fire is the natural means of maintaining grasslands so control of fire is a primary reason for the problem. Removing trees in the draws represents further manipulation by man.

Canada Thistle

We saw several infestations of Canada thistle (*Cirsium arvense* L.). The sites represented tree fall zones where large trees toppled. The disturbance at the base of the tree, the exposed "root ball," represents a temporary habitat for Canada and musk thistle (*Carduus nutans* L.) and other exotic but ephemeral weed species.

Other sites temporarily infested with Canada thistle were heavily used wildlife bedding areas or areas heavily trampled by large animals.

A third site type infested with Canada thistle was low lying soils characterized by a seasonally high water table. These sites are favorable for Canada thistle growth, especially in wet years such as 1993. Canada thistle is not well adapted to areas immediately adjacent to wet sites so no further encroachment can occur.

Recommendation -- Do nothing. The Canada thistle pappus and prolific seed production ensures a uniform blanket of long lived seeds which germinate when conditions are favorable, i.e. disturbances leading to the lack of competing vegetation or the presence of water-logged soils which temporarily reduces the competitive ability of perennial grasses.

Canada thistle does not represent an invasive threat to Wild Horse Island in its present state. It grows only where it can and the acreage is sorely limited. It can be controlled but it would be a waste of resources since it would return quickly to the small areas where it is well adapted. There are several insects that have been introduced for biological control of both Canada and mush thistle. Introduction of these insects is recommended.

Leafy Spurge

Older maps of Wild Horse Island show ~~one~~ TWO patches of leafy spurge (*Euphorbia esula* L.). We were unable to find it. Further searching should be done to determine if it exists. If found, the patch must be eradicated chemically for it represents a threat to the island. The animals present (deer and sheep) will eat seed heads, and seed will pass through the animals as they traverse the island.

If the patch (or patches) is(are) found, the judicious use of Tordon® is recommended for leafy spurge poses a far greater threat to WHI than a small amount of this unfairly maligned but valuable herbicide. Tordon should only be used on "Tordon safe sites:"

A Tordon safe site is a term used by Fay to describe a site where Tordon can be used with a minimum of risk. First and foremost, Tordon, if used correctly, is not a risk to man and other animals since the mammalian toxicity is very low. The major risk associated with Tordon use is its impact on non-target vegetation due to drift, leaching, or lateral movement on a soil surface.

- Do not spray Tordon if wind speeds exceed 2 mph to prevent drift.
- Do not apply Tordon to sites with less than 1% soil organic matter. This includes gravely or sandy soils. Tordon leaching is minimal if soils contain reasonable amounts of organic matter due to soil binding, and the correct rate is applied.

- Do not apply Tordon on sites which could conceivably be used for house lots within a five-year period. Some garden plants such as beans, peas, tomatoes, and potatoes are very sensitive to very low concentrations of Tordon. The grotesque herbicide injury symptoms on garden or ornamental plants years after use is distressing to all.
- Do not apply Tordon to soils which could conceivably be used as top soil on another site.
- Apply Tordon at correct rates by carefully matching the rate needed with the target weed. Calibrate all equipment so that the application rate falls within ±10% of the target rate. Application by back pack sprayers is frequently off by a matter of 100-400% if the users are untrained.
- Do not apply Tordon within an area 3 times the dripline of desirable, nontarget vegetation.

Spotted Knapweed

We found several patches of spotted knapweed (*Centaurea maculosa* Lam.) which caused us great concern. Much of the island, especially the exposed knobs and steep hillsides are prime knapweed habitat. The weed must be mapped and sprayed aggressively or else the outcome is known. It is far better to use a small amount of Tordon now than let the knapweed go. It is ready to increase dramatically.

Every knapweed plant we observed had been grazed. The main stem was removed and secondary shoots resulted with late blooming flowers. While these flowers probably will not set viable seed this season, they will in future, more typical years. It was obvious that knapweed has been on the island for a long time, and the wildlife were primarily responsible for controlling its spread. Before sheep stocking numbers are reduced, their contribution to knapweed control must be considered.

At several sites single flowering plants were found. Under each plant were approximately 30 to 50 knapweed seedlings, indicating a large resident knapweed seed bank. This means that a control program will need to be ongoing for many years for the knapweed seed bank will persist for many years. It was disturbing to make this observation.

Common Mullein

We observed mullein (*Verbascum thapsus*) at many sites. This plant colonizes gravely, infertile, dry sites. It is an exotic but its range is known and limited. No management is, in our opinion, necessary or possible.

We saw no other weeds of significance with the exception of cheatgrass (*Bromus tectorum* L.). We saw it repeatedly and that means that range condition must be maintained in as good a condition as possible or it will spread.

We would caution that any remarks are made as a result of our visual appraisal, systematic data collection might paint a different picture of the range resource. There is always a temptation to classify land based upon a quick look. We won't attempt that here.

DESCRIPTION OF RANGE RESOURCE (Halpop)

From a rangeland management perspective, the island could be described as a year-long continuous use pasture with bighorn sheep and mule deer as the principal herbivores. Since fencing doesn't appear to be an option, this is the grazing system that has to be managed. As noted elsewhere, there are about 325 bighorn sheep and 100 mule deer. These numbers are increasing in the absence of population control, relocation or hunting.

The island has been utilized by domestic livestock since the early part of this century, circa 1910. Past use has certainly had an impact on the current vegetation. Following are the principal grass species we observed on the September field day. They are all perennial plants and aren't listed in any particular order:

Bluebunch Wheatgrass	Agropyron spicatum native, cool season decreaser
Rough Fescue	Festuca scabrella native, cool season decreaser
Idaho Fescue	Festuca idahoensis introduced, cool season invader
Kentucky Bluegrass	Poa pratense introduced, cool season invader
Timothy	Phleum pratense introduced, cool season invader
Crested Wheatgrass	Agropyron cristatum introduced, cool season invader
Basin Wildrye	Elymus cinereus native, cool season decreaser

The principal forb species are:

Common mullein	Verbascum thapsus introduced, warm season invader
Arrowleaf Balsamroot	Balsamorhiza sagittata native cool season increaser
Sageworts	Artemisia sppnative warm season increaser

There are probably numerous early season forb species present on the island that weren't evident at the time of our visit. Spring forbs contribute to sheep diets across North America. Diets typically shift to grass species and in some locations include browse later in the year. The decreaser, increaser, invader designations describe how the particular grass species responds to improper cattle grazing. I'm not certain how accurately this designation translates to bighorn sheep use. Bluebunch wheatgrass is a fairly common component across the island in the open areas and dry slopes where you would expect to find it. Although considered a "decreaser" species, it is impossible to say what the bluebunch is "doing" in the present situation. The amount of arrowleaf balsamroot on the exposed south facing slopes may be an indicator of past grazing use. A native plant, arrowleaf balsamroot has the potential to increase.

We observed good grass cover across most of the areas toured. However biomass production is largely coincidence of the amount of precipitation a location has received.

Things to watch for under this type of use are animal distribution and uneven use. It was evident that the ridgetops, or higher ground are receiving the majority of grazing use, while the lower sites particularly underneath the tree canopy are being utilized to a much lesser degree. We understand that the Department is planning to reduce sheep numbers by 100 -200 animals. This will certainly lessen the grazing pressure on the forage resource. However the pattern of use will probably look very similar after animal reduction.

Recommendations:

- An aggressive noxious weed prevention/eradication program will be an important component of any resource management program. Invasive weed species have shown their ability to degrade range sites across western Montana. Research has demonstrated that spotted knapweed will invade ungrazed excellent condition bunchgrass range. Regardless of what the Department does with sheep numbers in the future, the limited infestations of spotted knapweed will certainly expand and increase in density.
- A low cost noxious weed educational program for seasonal residents and day users of the island may yield valuable results. Fish, Wildlife & Parks professionals have limited time to devote to the island management, yet it seems that recreational users are probably crawling all over the place. Having brochures available at the heaviest used boat landings and sending mailings to landowners may assist the department greatly in an early

awareness program. Two examples of "awareness" brochures that we use extensively are included.

* It would be advisable to adopt a rangeland monitoring plan that fits the resources and time available to the Fish, Wildlife & Parks Dept. If properly set up, a monitoring plan would yield invaluable range trend information. Trend is nothing more than assessing change over time. Some of the common indicators are species composition and exposed mineral soil. In the absence of such data it's extremely difficult to assess conditions as they are; are conditions improving, degrading or relatively stable? Included is the recently revised bulletin "MONITORING MONTANA RANGELAND" by John Taylor, Professor Emeritus, Range Science MSU and John Lacey, Extension Range Specialist. This bulletin does an excellent job of describing monitoring techniques.

SUMMARY

Our major concern is spotted knapweed. The condition of the mainland areas proves that Wild Horse Island can support the rampant growth of spotted knapweed. It is not rampant because there are no roads or motor vehicles on the island so spread has been severely limited.

This does not mean spotted knapweed won't spread, for it will. The present problem is manageable if the Dept. of FWP will commit to it in terms of manpower and funds.

PARTICIPANTS

Greg Bennett, Weed Supervisor
Lake County
Rt. 10, Mountain View Rd
Ronan, MT 59864

Jerry Sawyer
Department of Fish, Wildlife, & Parks
490 N Meridian Rd
Kalispell, MT 59901

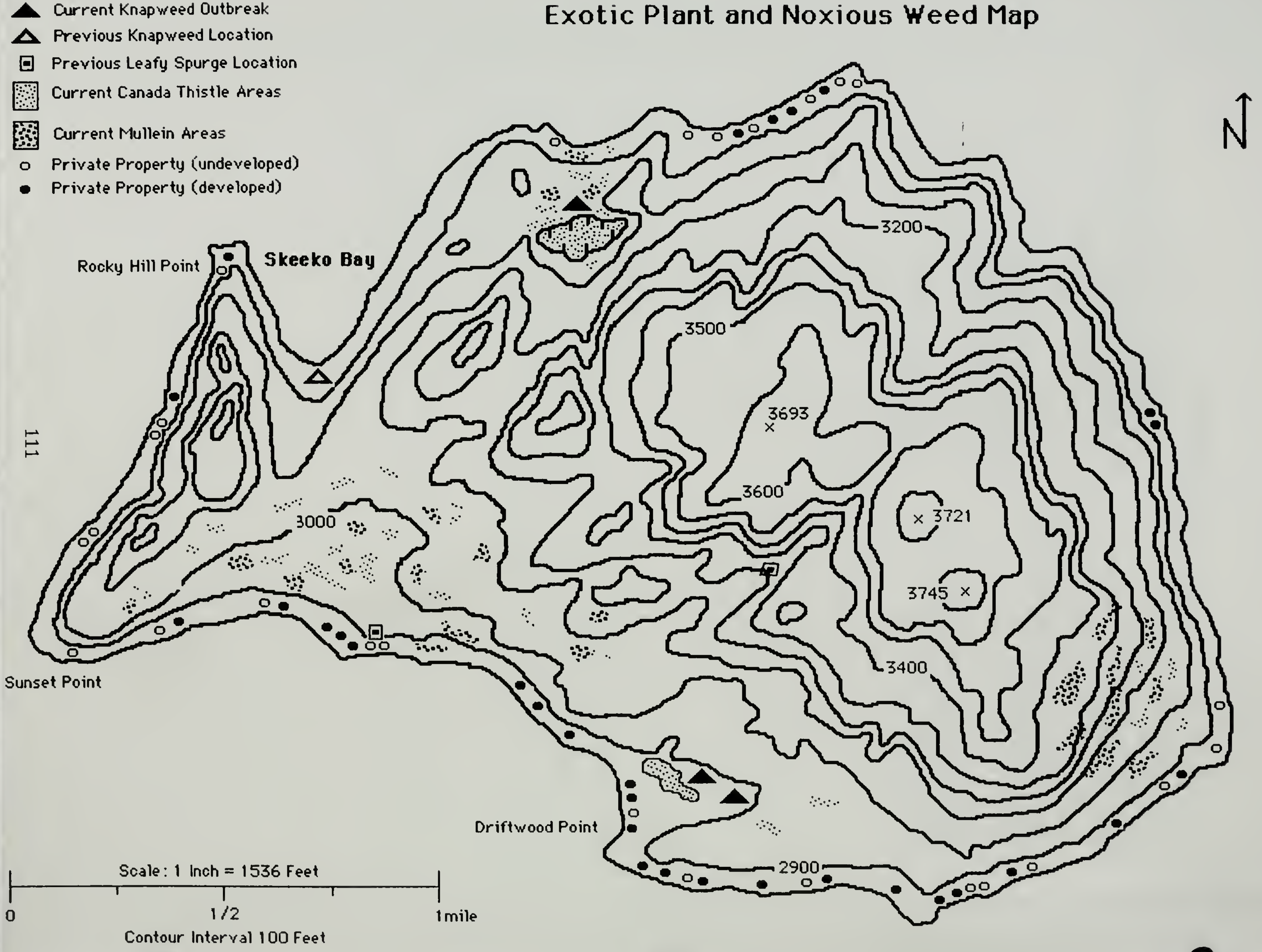
Merle Phillips
Department of Fish, Wildlife, & Parks
490 N Meridian Rd
Kalispell, MT 59901

John Halpop
County Extension Agent & Range Scientist
Sanders County Extension Office
PO Box 189
Thompson Falls, MT 59873

Pete Fay
Extension Weed Specialist
Department of Plant and Soil Science
Montana State University
Bozeman, MT 59717-0312

Mike Hutchins, County Commissioner
Courthouse
Ronan, MT 59864

Exotic Plant and Noxious Weed Map



▲ Current Knapweed Outbreak
△ Previous Knapweed Location
▣ Previous Leafy Spurge Location
▨ Current Canada Thistle Areas
▨ Current Mullein Areas
○ Private Property (undeveloped)
● Private Property (developed)
N
Rocky Hill Point
Skeeko Bay
Sunset Point
Driftwood Point
3200
3500
3693
3600
3721
3745
3400
3000
2900
Scale: 1 Inch = 1536 Feet
0
1/2
1 mile
Contour Interval 100 Feet

APPENDIX J

DRAFT

WILD HORSE ISLAND FIRE MANAGEMENT PLAN

prepared by

The Montana Department of Fish, Wildlife, and Parks

INTRODUCTION

Fire played a role on Wild Horse Island long before the first human. It has continued to play a dramatic role in shaping the island vegetative pattern in particular maintenance of a palouse prairie ecosystem. It is assumed visiting Salish or Kootenai Indians did not suppress naturally occurring fires on the island. When white people began attempting to settle the island in 1911, they started a period in the island's history where naturally occurring fires were suppressed (or held back as much as possible).

When Wild Horse Island became a Montana State Park in 1978, goals were established to preserve its natural conditions. All natural or human caused fires were suppressed as soon as possible after detection. During the first decade of park management, the Department and Wild Horse Island Task Force gained knowledge and perspective about the islands resources, ecological influences and human use effects. They determined that fire has a role on the island not only as a threat to the resource, as well as to public safety but also as a contributing factor to the preservation of the Palouse Prairie including some Rare Plants. With this in mind, the Department and Task Force decided a Fire Plan should be developed for Wild Horse Island State Park.

WILD HORSE ISLAND GENERAL DESCRIPTION AND MANAGEMENT GOALS

Wild Horse Island is a 2,165 acre island surrounded by the largest body of fresh water in the West: Flathead Lake. Though some attempts were made in this century to settle the island, it is essentially unchanged and natural. There are 52 privately owned lots on the island perimeter, one acre or less in size. The rest of the island became a state park in 1973.

Wild Horse Island has two predominant ecosystems -- a Douglas Fir forest and a Palouse "prairie". These provide habitat for several bird species, Bighorn sheep, mule deer, black bear, some small mammals and three (adopted) wild horses.

The management philosophy for the island park is: "To emphasize and conserve the islands natural qualities and provide primitive, dispersed public recreation".

FIRE MANAGEMENT PLAN OBJECTIVE

The purpose of this plan is to consider the occurrence and use of fire in obtaining the management goals of the island. The plans objectives are:

1. To protect persons and private property from fire that occurs in the park.

2. To protect and enhance public resources on the island such as the vegetative ecosystems, endangered species, historical structures, wildlife populations and recreation opportunities.

3. To identify actions and agency responsibilities in order to carry out the above.

AGENCY ROLES AND RESPONSIBILITIES

(to be filled in by State Forest ... and BIA)

Wild Horse Island lies within the "Flathead Fire Management District". The office of the State Forester has primary responsibility for the fire district but has contracted with the Bureau of Indian Affairs (BIA) who in cooperation with the Confederated Salish and Kootenai Tribe actually respond to fires.

PUBLIC INVOLVEMENT AND EDUCATION

This plan will be offered in draft form for review to:

1. The Wild Horse Island Task Force
2. The Wild Horse Lot Owners Association
3. The Nature Conservancy
4. The Bureau of Indian Affairs
5. The Department of State Lands
6. The Flathead National Forest
7. The Confederated Salish and Kootenai Tribe
8. Montana Historical Society
9. Lake County Weed Board
10. and other citizens and groups indicating interest in it.

If comments warrant a public meeting will be held to discuss portions of the draft plan or pertinent issues.

These comments will be used to prepare recommendations which will be discussed at a meeting of the Department of Fish, Wildlife, and Parks and the Wild Horse Island Task force. These discussions will be summarized and result in the preparation of a Final Plan. A public comment period of sixty days will be allowed on the Final Plan. Agency Actions, other than fire emergencies requiring suppression, will not occur until they can be incorporated into the budget process for island management.

This plan will be reviewed by the lot owners association and mailed to individual lot owners. Any prescribed burns will be done only after their notification and with the utmost care toward protection of private property.

ISLAND FIRE MANAGEMENT ZONES

This plan established five fire zones for the island. The criteria to establish the zones included:

1. habitat type
2. private property
3. historical values
4. species of concern

Within these zones, management units according to geographic location are identified. Each one of these management zones and units will be described below. In the management alternative section, alternatives will be discussed for each unit. This will be followed by recommendations for preferred alternatives and an action plan.

Private Property Zone

This zone includes the private lots and structures and a buffer zone around them of 500 feet from the lakeshore.

PZ - 1 (Private Property Zone, Unit 1)
This is the acreage owned by Ron Mac Donald and includes his modern cabin and the Hiawatha lodge and associated historical structures.

PZ - 2 (Private Property Zone, Unit 2)
This is the acreage lining the south shore of the island including the private lots and structures.

PZ - 3 (Private Property Zone, Unit 3)
This is the acreage lining the west shore of the island including the private lots and structures.

PZ - 4 (Private Property Zone, Unit 4)
This is the acreage including the private lots and structures on the northshore of the island. It includes the Jacques Roberts historical structure.

SZ - 1 (Species of Concern Zone, Unit 1)
This is a quarter mile area surrounding the Bald Eagle nest near Skeeko Bay.

SZ - 2 (Species of Concern Zone, Unit 2)
This is a 10 acre area where Silene Spalding can be found.

HZ - 1 (Historical Zone, Unit 1)
This 160 (?) acre area includes the Johnson cabin and barn, stone fence, homestead field and the Bighorn sheep corral.

HZ - 2 (Historical Zone, Unit 2)

This 160 (?) acre area includes the Powers Orchard, associated structures and fields.

HZ - 3 (Historical Zone, Unit 3)

This two, one acre parcels include the unnamed homestead root cellar and the upper Bighorn sheep corral.

GZ - 1 (Grassland Zone, Unit 1)

THis is the south slope palouse prairie acreage of the island.

GZ - 2 (Grassland Zone, Unit 2)

This is the east facing grassland on the west side of the island saddle.

FZ - 1 (Forest Zone, Unit 1)

This is the north slope, heavily forested side of the island.

FZ - 2 (Forest Zone, Unit 2)

This is the forested area along the south central shore of the island.

FZ - 3 (Forest Zone, Unit 3)

This is the forested area above the west shore of the island.

FIRE ECOLOGY

Fire is part of the natural environment ~~where~~ whether that be grassland or forest. Fire plays a role in determining and maintaining vegetative ecosystems. This role has been altered by man since the early 1900's with efforts to suppress occurring fires. However, in the last twenty years, the public and management officials have begun to recognize the ecological implications of suppressing all fires and well as the benefits of using fire as a tool to propagate certain vegetative patterns. Fire alters the succession of some plant species (in this case the encroachment of the ponderosa pine forest upon the palouse grassland. It also reduces accumulated duff and returns vegetative nutrients back to the soil.

ISLAND FIRE HISTORY

The BIA reports the following fire history since 1963 for Wild Horse Island:

1963 -- 30 acres burned -- cause unknown
1975 -- 3 acres burned -- cause unknown
1979 -- 3 Class A fires (less than 1/4 acres) -- lightening caused
1981 -- 1 Class A fire -- human ~~unknown~~ caused
1983 -- 1 Class A fire -- cause unknown
1987 -- 1 Class A fire -- lighting caused
1987 -- 1 Class A fire -- human caused

PARTICULAR PRESCRIPTIVE BURN PLANS

There are six Fire Management Zones where prescriptive burns have been identified as proposed actions. Each one of these areas must be studied closer for the need for a prescriptive burn, potential impacts of such a fire and particular methods of starting and controlling the fire, including costs.

Recognizing that there will be costs and that the Park budget is limited, priorities can be set for which particular zones and prescriptive fire plan could be implemented first. Using species enhancement as the first criteria and fuel reduction as the next, the Department recommends the following order of preparing specific prescription plans as well as implementation.

GZ - 2 (Grassland Zone, Unit 2)

Purpose of Prescription: To return nutrients back to soil and reduce fule load, to control invasion of Ponderosa Pine.

Methods: Mechanical thinning and piling of young Ponderosa Pines, burning of brush piles -- winter/spring. Ignited grass burn during wet season with controlled boundaries.

FZ - 2 (Forest Zone, Unit 2)

Purpose of Prescription: To open small acreages for Bighorn sheep grazing within the cover of the forest, to reduce the timber fuel load.

Methods: Mechanical thinning and piling of young Ponderosa Pines in designated open acreages within the forest, burning of brush piles--winter/spring.

GZ - 2 (Grassland Zone, Unit 2)

Purpose of Prescription: To return nutrients back to soil, reduce fuel load and control invasion of Ponderosa Pine.

Methods: Mechanical thinning and piling of young Ponderosa Pines, burning of brush piles -- winter/spring. Ignited grass burn during wet season with controlled boundaries.

SZ - 2 (Species of Concern, Unit 2)

Purpose of Prescription: To enhance soil and habitat for Silene Spaldings.

Methods: Ignited grass burn during wet season with controlled boundaries.

HZ - 1 (Historical Zone, Unit 1)

Purpose of Prescription: To reduce fuel load, enhance soil and perpetuate homestead range condition.

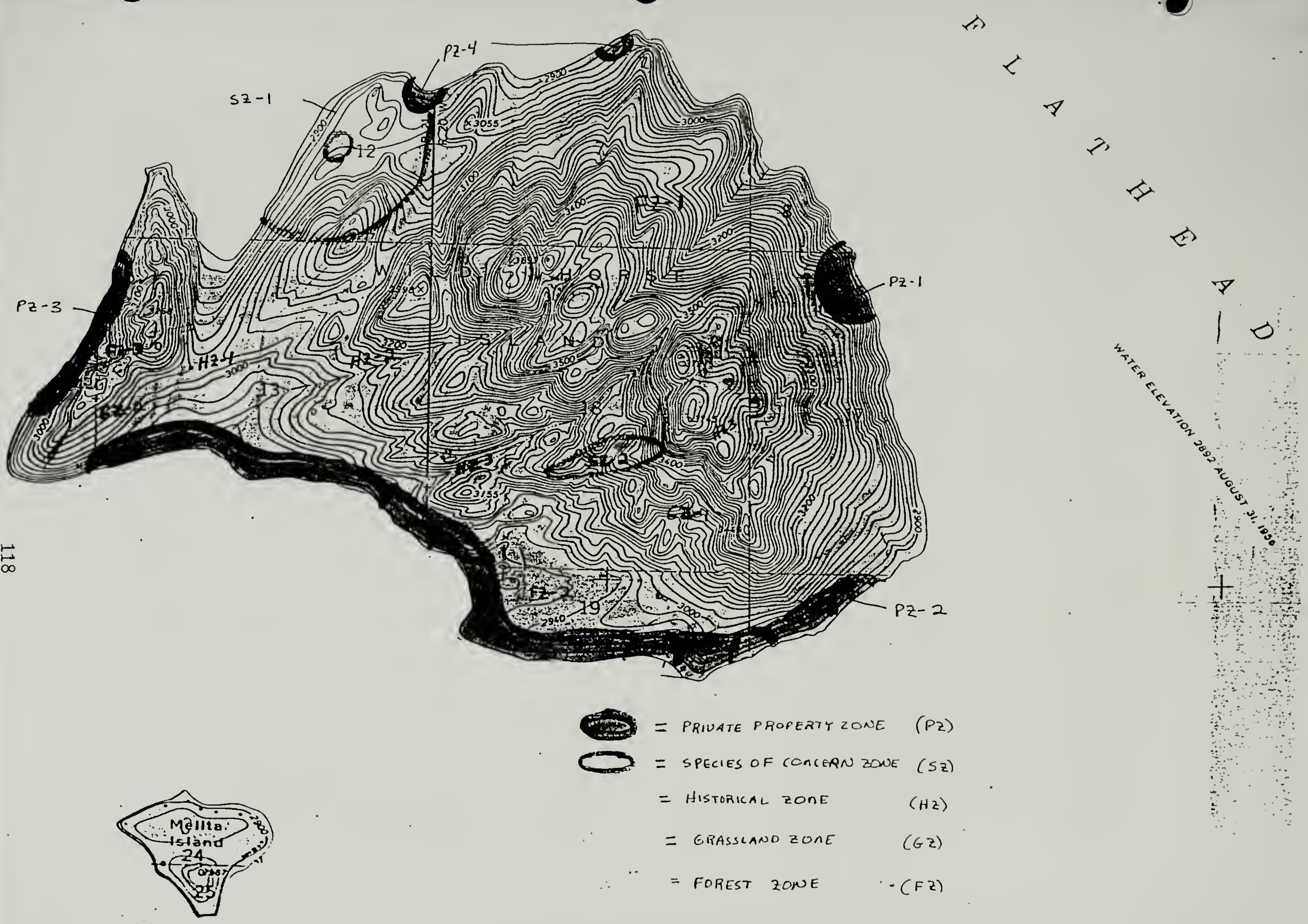
Methods: Ignited grass burn during wet season with controlled boundaries -- buildings protected.

HZ - 2 (Historical Zone, Unit 2)

Purpose of Prescription: To reduce fuel load, enhance soil and perpetuate homestead range condition.

Methods: Ignited grass burn during wet season with controlled boundaries -- "orchard and associated items" protected.

ZONE	SPECIES ENHANCEMENT	FUEL REDUCTION	PRIORITY
SZ - 2	Silene Palouse	not extreme	# 4
HZ - 1	Palouse Historical	not extreme	# 5
HZ - 2	Orchard Historical	not extreme	# 6
GZ - 1	Palouse Prairie	yes -- needed	# 1
GZ - 2	Palouse Prairie	not as bad	# 3
FZ - 1	Douglas Fir Bighorn sheep	needed but tough to implement	# 2


F L A T H E A D
WATER ELEVATION 2892' AUGUST 31, 1956
WILD HORSE
ISLAND
PZ-4
SZ-1
PZ-3
PZ-1
PZ-2
HZ-4
HZ-3
HZ-1
SZ-2
GZ-1
FZ
3055
3155
3500
3200
3000
2900
12
13
18
19
Melita Island
24
25
= PRIVATE PROPERTY ZONE (PZ)
= SPECIES OF CONCERN ZONE (SZ)
= HISTORICAL ZONE (HZ)
= GRASSLAND ZONE (GZ)
= FOREST ZONE (FZ)

SAMPLE

APPENDIX K

DRAFT

REQUEST FOR PROPOSAL

To provide guided hiking tours of Wild Horse Island State Park. This is a solicitation to all qualified persons, partnerships, and corporations to submit a bid proposal for the above service to the State of Montana, Department of Fish, Wildlife and Parks, Division of Parks.

OVERVIEW

Wild Horse Island is a 2140 acre island State Park administered by the Montana Department of Fish, Wildlife and Parks, Parks Division. It is noted for its endangered Palouse Prairie plant species and incredible wildlife viewing of Rocky Mountain Big Horn Sheep, Mule deer, Bald Eagles, songbirds and wild horses. The visitor use season is primarily May through September. Wild Horse Island is maintained in a natural primitive condition and there are no facilities or marked trails.

DEADLINE FOR SUBMISSION

Bid proposals must be received on or before noon, ________________ ,1993 by the Division of Parks at the Montana Dept. of Fish , Wildlife & Parks Headquarters, Helena, Mt. They shall be in a sealed envelope plainly marked, Bid Proposal for Wild Horse Island - Hiking Tour. Bids received after closing time will be returned unopened. Immediately after closing time all bids will be publicly opened and duly recorded at the Helena office.

PURPOSE

The Division of Parks desires to offer certain services to the public visiting the Flathead Valley and to promote watchable wildlife viewing opportunities in Montana State Parks. The uniqueness ofWild Horse Island affords this opportunity. The service to be offered includes guided hiking tours of the island whereby the visitor may enhance their knowledge and enjoyment of nature through observation of various plant and wildlife species as they occurr in a natural setting. The Division of Park's desire is to provide this service thru contract with a qualified person(s), business etc,. The Division of Parks realizes that the contractor must receive a reasonable profit in order to continue providing the service. The Division recognizes it's responsibility to insure that the prices charged for the service are reasonable. The Division also desires that having a concession for the purpose stated above must not cost the State and that appropriate rental be charged the contractor.

STATE OBLIGATIONS

No obligation expressed or implied will be required of the State of Montana, the Department of Fish, Wildlife and Parks, or the Division of Parks unless negotiated and made a part of the final contract.

INFORMATION REQUESTED FROM OFFERORS

Offeror's proposals should be submitted in the standard format outlined below to facilitate fair and equitable evaluation of all proposals received.

OFFEROR'S BUSINESS ORGANIZATION

Offeror's will state the full name and address of their organization, including the name of the president or head of the organization and, if applicable the branch office or other subordinate division or branch and its location that will perform or assist in the performance of the contract.

Offeror's will indicate whether their organizaton operates as an individual, partnership, or corporation.

INDEPENDENT PROPOSAL

By submission of a proposal the offeror certifies that the proposal has been arrived at independently without consultation, communication or agreement with other offerors to restrict competition.

The person signing the proposal certifies that he/she is the person in the offeror's organization legally responsible and that any offers made pursuant to this R.F.P may be binding on the offerors organization upon acceptance by the Commission of Fish, Wildlife and Parks.

NEWS RELEASES

News releases pertaining to this R.F.P. or the awarding of the concession by the Commisision or the negotiations of a contract under that award will not be made without prior approval of the Division of Parks.

PRIOR EXPERIENCE

As part of the proposal the offerors will provide an individual or corporate resume (whichever is applicable) briefly stressing recent work experience that would indicate the possible success of operating the type of concession requested.

FINANCIAL STATEMENTS

The offeror will provide as part of the proposal a financial statement indicating adequate funds are available or obtainable to effectively establish and maintain the operation.

REFERENCES

The offeror will provide as part of the proposal a list of references or persons who could attest to the character and business abilities of the offeror.

COMMITMENTS

The offeror will provide as part of the proposal a list of suppliers for the goods and/or services and attest to the fact that the commitments have been made by them and that if a contract is awarded to the offeror the suppliers will fulfill their commitments.

ACCOUNTABILITY

The offeror will provide as part of the proposal a sample or description of an acounting system to be used which would reflect receipts of gross sales, taxes collected, and in general a record keeping system for the purposes of an audit. All concessions that have as part of their contract a rental fee based on percentage of gross sales is subject to a State audit and monitoring by the Finance unit.

PERSONNEL AND NONDISCRIMINATION

The concessionaire will be responsible for hiring the necessary employees to conduct the concession operations. Salaries and hours of work must conform with all State and local laws, rules and regulations now in force or which may hereafter be promulgated. The concessionaire shall comply with the requirements of all Federal and State laws, rules and regulations relating to minimum wage, social security, unemployment insurance, and workman's compensation.

The concessionaire will be required to comply with the letter and spirit of all applicable laws respecting discrimination and unfair employment practices as required by Equal Opportunity and Affirmitive Action Policy.

The concessionaire and employees will also be required to practice nondiscrimination in the furnishing of goods and services to the public. The concessionaire shall require all employees to observe all applicable rules and regulations and to exercise courtesy and consideration in their relations with the public. The Division of Parks requires the concessionaire and its employees who come in contact with the public to wear a uniform, badge or other identification to show they are concession employees.

MINIMUM REQUIREMENTS

It is anticipated that the contract entered into as a result of this Request For Proposal will satisfy the purpose described. Further, it will be noted the following conditons are required for consideration of any bid proposal and resulting contract. That a minimum of $500.00 or 6% of gross sales, whichever is greatest, will be provided by the concessionaire to the State of Montana. That the contract will be for two years and that if the proposal contains a request for additional time, that additional period may be an option to be negotiated.

That a list of services, quality and costs to the general public be identified in the proposal. The contract will allow for the change of prices thru mutual agreement. The proposal will describe the minimum operation dates of the concession as from May 21 to September 6. The dates may be changed by mutual agreement after experience has shown a need for a change. That all laws, rules or regulations applying to State Parks and specifically to Wild Horse Island will be adhered to. That tours are to be fully guided with a maximum group size of ten. That only one tour group will be allowed on the island at any time and only one per day. That all advertising will be the responsibility of the concessionaire and no additional facilities will be provided for the operation of this concession by the Division of Parks. That all tours will be available to visitors at Big Arm State Park. That all landings will be on the south or east side of the island. That the Division of Parks may impose additional resrtictions as required to protect the natural integrity of the Island.

CONCESSIONAIRE WILL PROVIDE

1. Public Liability Insurance in sum of $750,000 per occurrence and $1.5 million per claim, in accordance with 2-9-108 MCA.

2. Vessel for access to Wild Horse Island and all personal boat safety equipment for passengers as required by Federal and State Law.

3. Means for removal of any trash generated by tour group and mitigation measures for disposal of human waste.

4. A competent reliable tour guide for group related island activities.

5. A competent reliable vessel operator for transportation of tour group to the island.

6. All necessary permits from the Confederated Salish and Kootenai Tribes, Flathead Indian Reservation, for operation of this concession within reservation boundaries.

7. Assurance that all local, State, and Federal laws, rules, and regulations applicable to its business will be complied with.

BID PROPOSAL FORMAT

In addition to the requirements above, please address the following:

Section A. Plan for tour operation -

Please describe in detail what, how, when and at what estimated cost you plan to provide the service requested. This should include: proposed type & quality of service, group size, number of tours per week, start/end times, dates, area or trails to be utilized (include map and sketch drawing), type of vessel used for transport to and from the island, ingress and egress points, method for trash disposal and mitigation of generated human waste, plan for handling of any medical or other emergencies (i.e. EMT certified guides, radios, evacuation arrangements), methods to reduce or negate impacts/ disturbance to wildlife and vegetation.

Section B Compensation to the State of Montana for permission to operate organized commercial tour. Please describe what additional compensation you would provide if your bid is accepted beyond the minimum required. (A reminder, your bid will be in competition with all others received).

Section C Additional proposal you wish to offer not previously mentioned.

EVALUATION OF BID PROPOSALS

The Division of Parks will apply standard criteria and weights to each item requested in the proposal.

APPENDIX L

Management Stategy Matrix (MSM)

To complete the matrix form (Fig. 1), the manager begins by filling in the information in the upper right hand corner. This information helps to organize the data and identify key elements such as the specific area, the opportunity class, the area objective or the unacceptable impact being assessed (this matrix can be used to determine preferred techniques to meet an area's objective or for solutions to a particular impact). When completing the matrix portion, special notice should be taken of the opportunity class and objective as this will have some influence on the determination of of values assigned to each technique. Some techniques will have a higher or lower value for a particular decision criteria based on these classifications. For example, a management technique or action such as designating campsites or increased signing would not be conducive to an area managed as an Opportunity Class 1 area. Whereas, in an Opportunity Class 2 or 3 these techniques might be acceptable.

At the bottom of the chart are the management technique ranking scale and the decision and the decision criteria weighting scale. Both scales are based on a 1 to 3, least to most value system. The technique ranking scale is least to most applicable and is used to obtain a subjective value for a particular technique. On the other hand, the weighting scale is least to most important. The Weighting

Management Strategy Matrix

Date ________

Decision Criteria

Area ________________

Opportunity Class ________

Mgmt Objective ________

Impact I.D. ____________

Management Strategies	Management Techniques	Cost Effectiveness (matls. & supplies)	Applicable w/Personnel	Timely Implementation	Implement At Park Level	Consistent with Mgmt. Objectives	Probability of Reducing Occurrence	Maximize Recreation Opportunities	Public Acceptibility	Non-Restrictiveness	Other	Unweighted Total	Weighted Total
	Weighting Factor												
Modify Behavior	Handouts Brochures												
	Signing												
	Off-site Interp. Programs												
	Increase Patrols & Enforcement												
	Field Contacts (Interpretive)												
Modify Site	Designate Campsites												
	Site Rehabilitation												
	Install Fire Grills												
	Increase Level Of Maintenance												
	Tent Platforms												
Modify Use	Zone For Specific Use (i.e.________)												
	Limit Access												
	Limit Party Size												
	Special Regs. (i.e. ________)												
	Temp. Closures (seasonal/annual)												
	Direct Use To Alternate Areas												
	Provide Access to New Areas												

TECHNIQUE/DECISION CRITERIA (Ranking Scale)
1 - Least Applicable to 3 - Most Applicable
N/A - Not Applicable

WEIGHTING SCALE FOR DECISION CRITERIA
1 - Least Important to 3 - Most Important

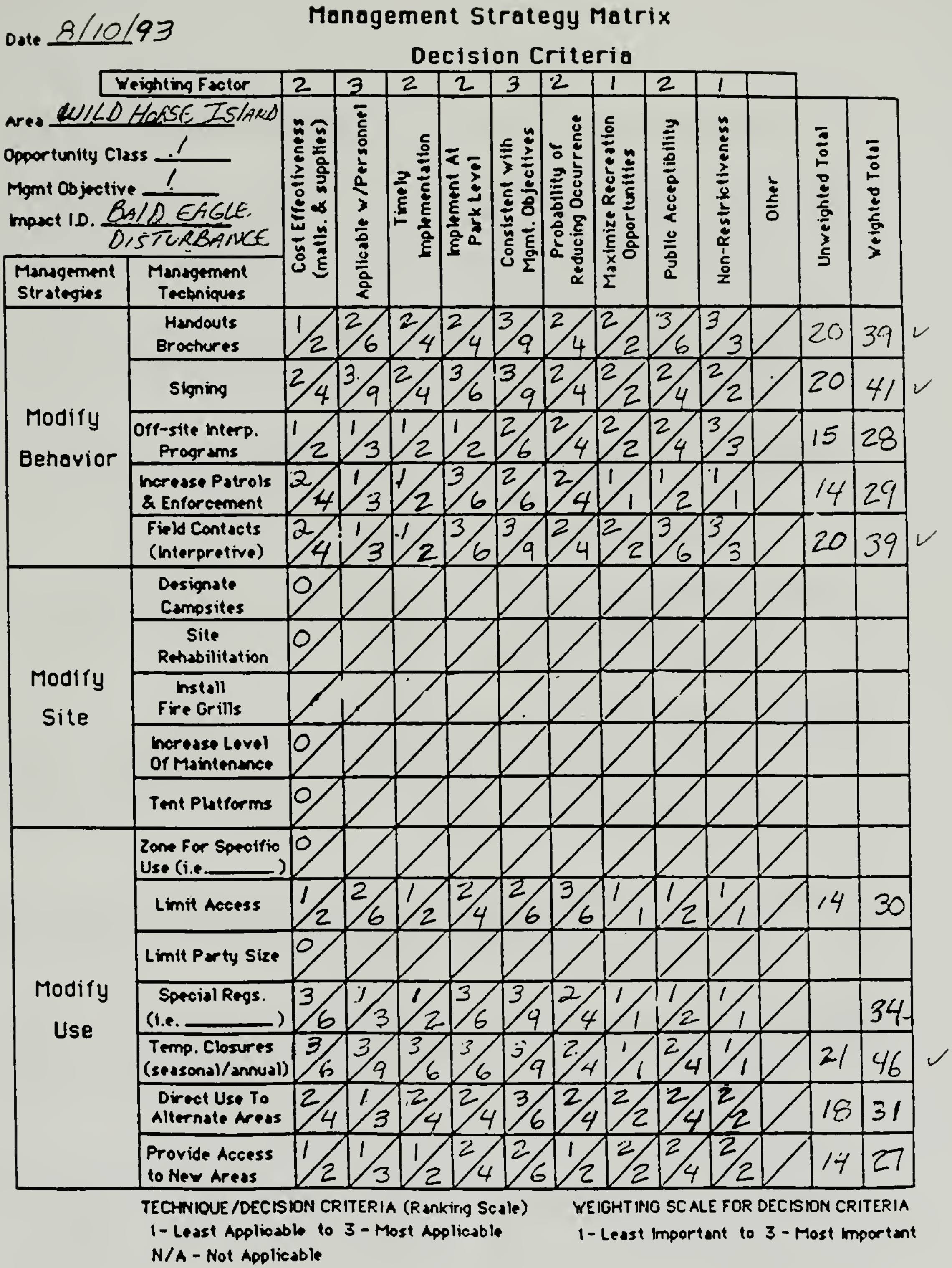
Figure 1. Management Strategy Matrix

scale is meant to differentiate which criteria are judged to be most influential in making a decision. This will help to eliminate the potential problem of arguments over whether one criteria is of as equal importance as another when scores are totaled. Both scales could be numerically expanded if deemed necessary or more important.

The main section of the MSM is comprised of rows and columns making up separate cells. Each cell is divided into an upper and lower half. The upper half is for raw scores, which are initially decided upon by those concerned. The lower half is for weighted scores, which are derived by multiplication of the raw score and the weighting factor. The weighted score will reflect the greater or lesser importance placed on specific decision criteria.

The main section has two major headings. The first, management techniques, is in the vertical column. From a review of recreation research literature and knowledge of management practices by various government land agencies, these were determined to be the most commonly implemented over a wide range of dispersed recreation problems. The techniques/actions have been categorized into three broad strategy units. These are modification of behavior, of use and of the site. The second major heading is decision criteria located horizontally at the top of the matrix. These are determined by managers and are based upon factors which are thought to most likely influence the decision making process. Decision criteria may vary among managers and are best derived by mutual agreement with other pertinent staff.

Management techniques are compared against a decision criteria moving down each column and a ranking scale number is inserted into the upper half of the appropriate cell. This step proceeds downward as opposed to across a row so that a better comparison can be made between techniques. Individual columns are then successively filled in across the matrix. If a management technique is judged not to be applicable to the impact or objective being assessed, then a zero is placed in the cell. For instance, the technique of installing fire rings would not resolve the problem of human waste. Therefore, a zero would be placed in the cell of the first column and the technique would not be considered when assessing other criteria. This method will eliminate some of the apparent complexity and time consuming nature of the matrix, since certain techniques will not apply to the unacceptable condition or objective being assessed. After the upper half of each cell has been filled in across the matrix, then each value is multiplied by the specific weighting factor and the resulting total is inserted into the lower half of the cell. Weighted and unweighted values are then totalled horizontally for each management technique and the totals are placed in the appropriate columns (Fig. 2). Comparisons are then made between the relative merits of the most preferred (highest scoring) management techniques and actions. Once evaluations are completed, a preferred management alternative can be selected either singly or in combination with other preferred alternatives and developed into an action plan to help meet area objectives or resolve an unacceptable impact.



Management Strategy Matrix

Date 8/10/93

Area WILD HORSE ISLAND
Opportunity Class 1
Mgmt Objective 1
Impact I.D. BALD EAGLE DISTURBANCE

Decision Criteria

Management Strategies	Management Techniques	Cost Effectiveness (matls. & supplies)	Applicable w/Personnel	Timely Implementation	Implement At Park Level	Consistent with Mgmt. Objectives	Probability of Reducing Occurrence	Maximize Recreation Opportunities	Public Acceptibility	Non-Restrictiveness	Other	Unweighted Total	Weighted Total	
	Weighting Factor	2	3	2	2	3	2	1	2	1				
Modify Behavior	Handouts Brochures	1/2	2/6	2/4	2/4	3/9	2/4	2/2	3/6	3/3		20	39	✓
	Signing	2/4	3/9	2/4	3/6	3/9	2/4	2/2	2/4	2/2		20	41	✓
	Off-site Interp. Programs	1/2	1/3	1/2	1/2	2/6	2/4	2/2	2/4	3/3		15	28	
	Increase Patrols & Enforcement	2/4	1/3	1/2	3/6	2/6	2/4	1/1	1/2	1/1		14	29	
	Field Contacts (Interpretive)	2/4	1/3	1/2	3/6	3/9	2/4	2/2	3/6	3/3		20	39	✓
Modify Site	Designate Campsites	0												
	Site Rehabilitation	0												
	Install Fire Grills													
	Increase Level Of Maintenance	0												
	Tent Platforms	0												
Modify Use	Zone For Specific Use (i.e.________)	0												
	Limit Access	1/2	2/6	1/2	2/4	2/6	3/6	1/1	1/2	1/1		14	30	
	Limit Party Size	0												
	Special Regs. (i.e. ________)	3/6	1/3	1/2	3/6	3/9	2/4	1/1	1/2	1/1			34	
	Temp. Closures (seasonal/annual)	3/6	3/9	3/6	3/6	3/9	2/4	1/1	2/4	1/1		21	46	✓
	Direct Use To Alternate Areas	2/4	1/3	2/4	2/4	3/6	2/4	2/2	2/4	2/2		18	31	
	Provide Access to New Areas	1/2	1/3	1/2	2/4	2/6	1/2	2/2	2/4	2/2		14	27	

TECHNIQUE/DECISION CRITERIA (Ranking Scale)
1 - Least Applicable to 3 - Most Applicable
N/A - Not Applicable

WEIGHTING SCALE FOR DECISION CRITERIA
1 - Least Important to 3 - Most Important

Figure 2. Example of Completed Management Strategy Matrix

List and Definitions of Decision Criteria

Decision Criteria - Standards, tests, rules, and guidelines by which the decision process is conducted and upon which judgements and solutions are based.

Cost of Materials and Supplies - Seeks to identify the least expensive technique in regards to estimated dollar value of the materials and supplies.

Applicable with Existing Personnel - Asks the question, are there currently enough people on the staff to do the job and do they have adequate time to implement the technique.

Timely Implementation - The degree to which a technique can be implemented within a reasonable timeframe, generally within the course of a season.

Can Be Implemented at the Park Level - The degree to which the technique can be put into effect at the local level. Seeks to determine if the technique is more appropriately dealt with at the Regional or Park level.

Consistent with Management Objectives - This deals with the extent to which the technique meets previously identified specific or general objectives of management.

Probability of Reducing Occurrence - (To be used for assessing impacts) The best guess estimate of the degree to which a technique either eliminates, reduces, or prevents the reoccurrence of a particular problem.

Maximize Recreation Opportunities - The extent to which a technique provides for the most diverse utility in a given area.

Non-Restrictive - The extent of the controlling nature of a technique on a visitors freedom of movement or choice.

Management Techniques

MODIFY BEHAVIOR -

Handouts/Brochures - An effective way to reach a large number of visitors. This technique is most effective when combined with personal contact with staff. Brochures/handouts can range from elaborate full color publications to simple, inexpensive quarter page photocopies. Clear, concise writing along with a professional overall design enhances the effectiveness of printed matter. (Bradley,1981; Echelberger,1977; Krumpe, 1982; Roggenbuck,1981)

Signing - Signs can be an effective means of disseminating information. They can take many forms and are used to educate the visitor to a wide variety of subject matter such as rules and regulations, expected conditions, environmental ethics, warnings, and alternative areas and directions. Signing is a very common technique, however the manager should be aware that the three components of signs (design, placement, and message) either alone or in combination, will have a considerable influence on their effectiveness. (Bradley,1981; Hendee et al.,1978; Sharpe,1982)

Field Contacts (Interpretive) - This technique has been shown to be effective in reducing visitor impacts. It is particularly useful for educating visitors who return repeatedly and receive reinforcement of the original message. It is also a useful tool for soliciting support for management activities. (Cole,1986; Roggenbuck,1981)

Off-Site Interpretive Programs - When dealing with organized user groups (ORV clubs, Church groups etc.) use of off-site programs can be effective for transmitting rules, regulations and for receiving public input. Programs may take many forms including lectures, slide shows, and/or question and answer sessions. (Bradley,1981)

Maintain Standards - Through maintenance of compartment standards in combination with information dissemination, visitors are better able to match their abilities and preferences with the recreational opportunities provided by the Park. Hence recreational experiences should be enhanced.

Increase Enforcement and Patrols in Areas - In cases of ongoing rule violations or disruptive behavior, high visibility patrols can be an effective deterrent. High visibility of all field staff including maintenance workers can be effective as these people will carry some perceived authority. Additionally, increased citations and well publicized prosecutions of extreme cases can also act as a deterrent.

MODIFY SITE -

Designate Campsites - In order to minimize resource degradation in a specific area, it may be necessary to place limits on the number of campsites available in the area. This approach can take the form of designation of campsites and can be effective in reducing the proliferation of random campsites, especially in sensitive areas. It should be noted that the technique implies that an effort must be made to educate the visitor to its purpose and to enforce its requirement. (Echelberger, 1977; Hendee et al.,1978; Stankey,1980)

Facility Removal - Overuse of an area may in part be due to its attractiveness. Facilities present may contribute to the attraction of visitors. Removal of facilities can help reduce use and subsequent resource damage by eliminating some of the elements that draw the visitor to the area. (Hendee et al., 1968; Lucas,1980; Murray,1974; Stankey,1973)

Site Rehabilitation - One method of mitigating damage to an area is to rehabilitate individual sites. This may include soil preparation, fertilization, irrigation, and revegetation with native plant species. In addition, closure of the sites and enforcement of this measure may also need to be dealt with.

Install Fire Rings - This technique refers to the installation of manufactured fire rings or the construction of rock fire rings.

Their purpose is to attract visitors to preferred sites and to reduce the proliferation of random campfires.

Install Toilets - Despite all other attempts to deal with human waste, it may eventually become necessary to install toilets if sanitation problems persist. Human health is not the only reason as release of nutrients and pollutants associated with increasing recreational use can result in aquatic growth that adversely affects aesthetics as well as health. (Barton,1969; Leonard,1979; Stankey,1973; Temple,1982)

Install Barriers and/or Gates - In order to restrict or channel visitor use, barriers or gates might be utilized. They may be used as a result of closures, site design, limiting access, or for safety reasons. They can include vegetative or man-made structures. Consideration should be given to the design and placement of barriers/gates as these can have a direct influence on effectiveness. (Bayfield,1982; McEwen,1976; Matheny,1978)

Increase Cleanup Effort - Instead of focusing on the cause of an unacceptable impact, at times it may be more efficient to remove the problem. Classic examples are collection of litter and removal of human waste. Through additions of personnel, a change in job description, or an increase in frequency of routine maintenance, effective control may be attained.

MODIFY USE -

Limit Length of Stay - Total use of problem areas can substantially be affected by reducing the amount of time visitors spend in these areas. If total use can be lowered, the extent and severity of impacts may also be reduced. These limits can take the form of regulations setting a specific time limit, (for example, the number of nights a party may camp at one particular site) or it may be voluntary with stay limits suggested. (Parsons,1983)

Limit Party Size - Large groups can cause more environmental damage and also may be a source of conflict with other user groups. Resource damage and visitor conflicts may be reduced by placing a limit on party size in a given area. (Lime,1972; Stankey,1973,1980; Lucas,1980)

Limit Access - Limiting use in a problem area is an effective method for reducing the degree and extent of resource damage. Use levels can be lowered if it becomes difficult to get to, or move about in an area. Physical access can made more difficult by closing or not maintaining roads or trails, or by removal of bridges etc. Other ways of limiting access include permit requirements, prohibiting vehicles or other specific modes of transport. (Echelberger,1977; Stankey,1973,1980)

Zone for Specific Use - Conflicts between different user groups can be reduced by designating areas for specific uses or by prohibiting a particular use from an area. Examples of conflicting uses include; snowmobiles and cross-country skiers, mountain bikes or packstock and hikers, and visitors with pets. Separation of user groups can be either regulated or voluntary. (Lime,1972; McEwen,1976; Stankey,1973; West 1982)

Provide Access to New Areas - Redistribution of use may occur by providing access to alternate areas. New or improved trails or roads could make certain areas more attractive to visitors and hence reduce resource damage in problem areas. Caution must be used in utilizing this approach as it may only spread impacts over a broad area as opposed to reducing them. (Cole & Dalle-Molle,1982; Hendee et al.,1978)

Temporary Closures - Due to seasonal variation in resource sensitivity, the same amount and type of use can result in varying degrees of impact. This is particularly true for wildlife during breeding seasons, and with trail and campsite damage by packstock during the spring and early summer. Such impacts can be reduced or avoided by prohibiting all or certain types of use during the sensitive period. (Cole,1981,1983; Vos,1985; Weaver,1978; Willard and Marr,1970)

Permanent Closures - Due to the uniqueness or fragility of an area, the severity or extent of resource damage or to redistribute use, permanent closures to certain types of use may prove to be effective. (See "Temporary Closures" for references)

Direct Use to Alternate Sites - Severe resource damage from overuse can be in due in part to the area's relative attractiveness. Use of problem areas can be reduced through manipulation of attractions and facilities. If the attractiveness of other sites can be effectively communicated to visitors, a shift of use away from problem areas could occur. (Hendee et al.,1968; Lucas,1980)

Special Regulations - In some cases special regulations may become necessary when other attempts to alleviate severe or extensive impacts fail or are too costly. For example, regulations may be used to prohibit or limit overnight camping, prohibit pets, prohibit campfires, etc. These may apply Park-wide, or only to specific areas. (Lucas,1982; Parsons,1983)

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FLATHEAD LAKE STATE PARK

WILD HORSE ISLAND

DRAFT

APPENDIX M

PRIVATE PROPERTY

There are 5[illegible] privately owned one acre lots located along the perimeter of the island. Over half of these have cabins and boat docks. Lot owners must abide by public use regulations when they are off of their property. Please respect the rights of these individuals when beaching your boat, picnicking, or hiking near their property.

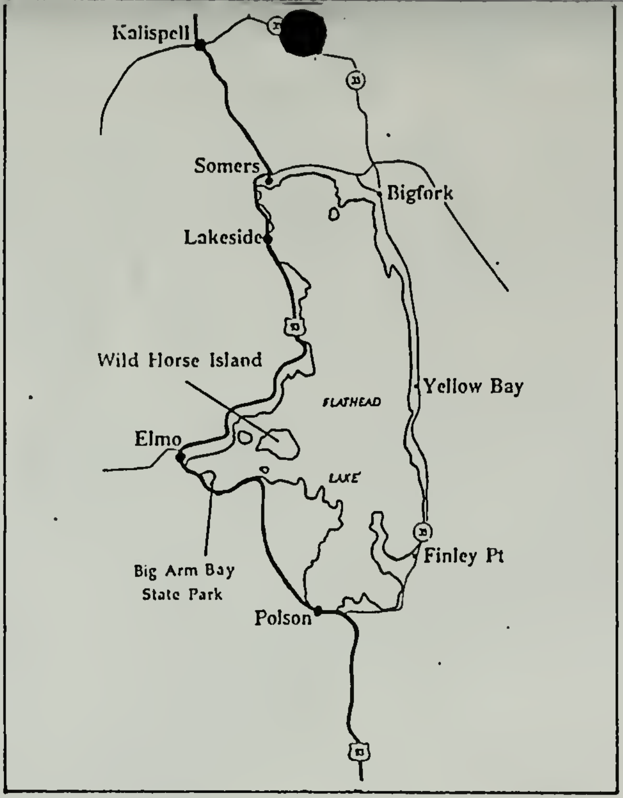
LANDING

Visitors are welcome to beach their boats at any of the five public landing sites on Wild Horse Island. Since there are no public docks on the island, visitors are encouraged to land at these sites to minimize effects of human use. CAUTION: Visitors are cautioned to secure their boats adequately and be watchful for severe windstorms which can occur suddenly.

VISITOR RESPONSIBILITIES

> Use of any weapon, firearm or firework is not permitted
> Pets are not allowed in the park
> Vehicles, including bicycles, may not be operated in the park
> Fires, barbecues and camp stoves are not allowed and smoking is not recommended due to fire danger
> Littering and the disturbance or removal of natural features, objects, or park property is prohibited
> A permit is required for commercial or group use

For more information or to report any violations, please contact:
Montana State Parks
490 N. Meridian Rd.
Kalispell, MT 59901
(406) 752-5501



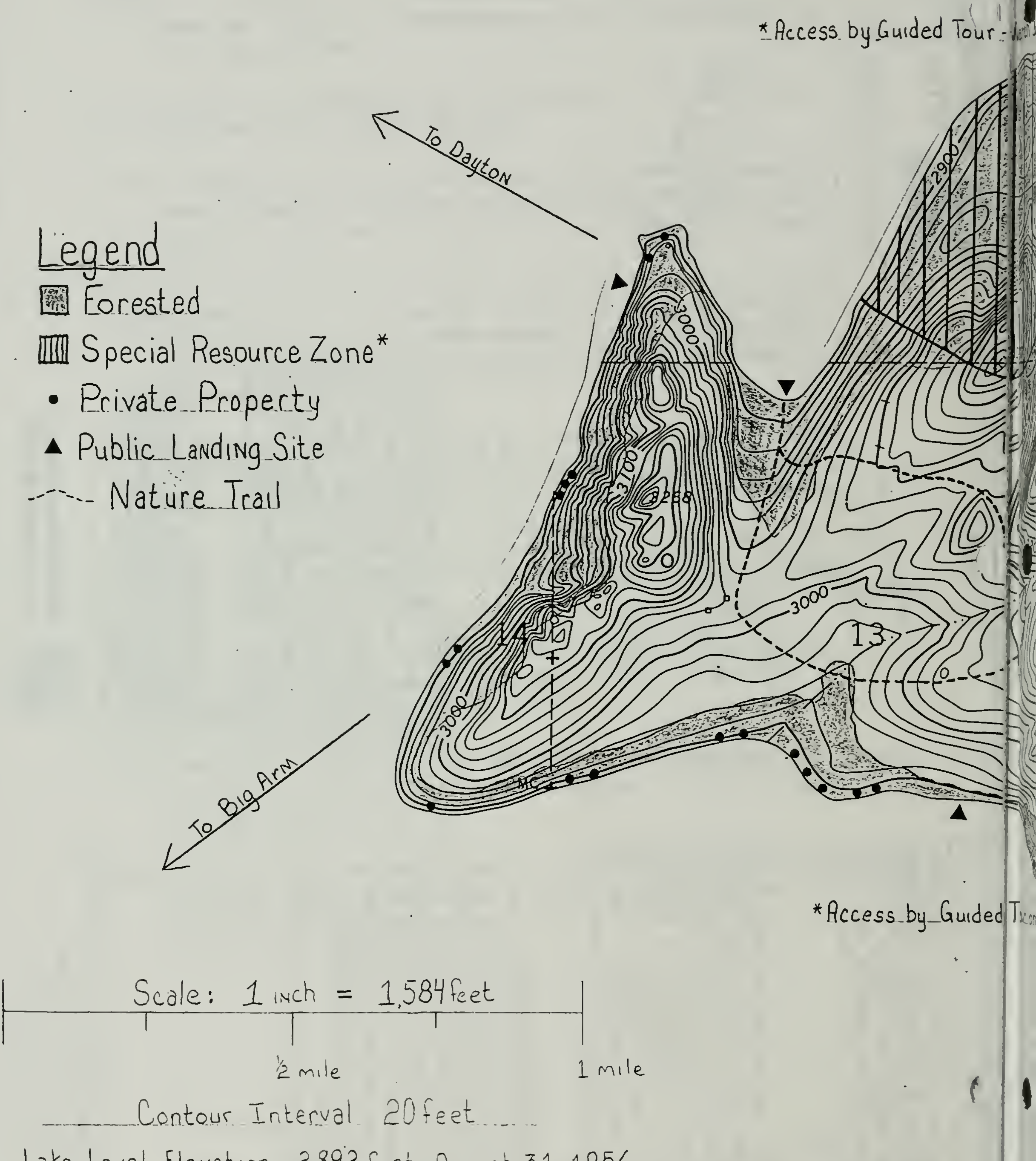
GETTING THERE

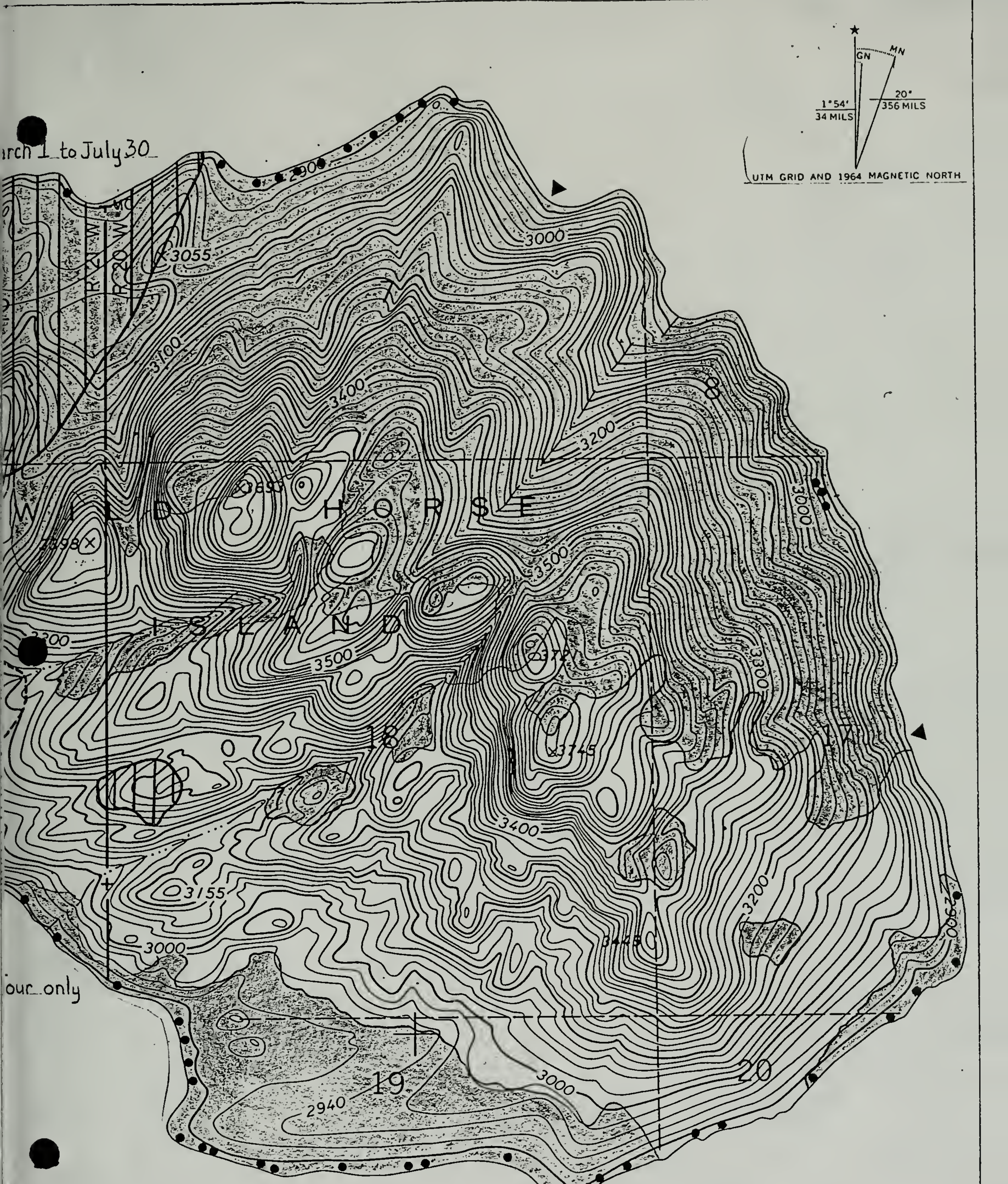
Access to the island is via boat. One nearby mainland public access point is Flathead Lake State Park -- Big Arm. The park is located approximately 35 miles south of Kalispell and 13 miles north of Polson along U.S. Highway 93. Boats may be rented at any private marina. No commercial tours of the island are available. A tour boat out of Polson journeys around the island, but does not land.

We receive federal funds and prohibit discrimination on the basis of race, color, sex, age, national origin, or handicap. For information or concerns regarding discrimination, contact Personnel Officer, Montana Department of Fish, Wildlife and Parks, or Office of Equal Opportunity, U.S. Department of the Interior, Washington, D.C. 20240.

Montana Department of Fish, Wildlife & Parks

Wild Horse Island




arch 1 to July 30
2900
3055
R 21 W
R 20 W
MC
3000
7
3100
3400
8
3200
3653
W I L D H O R S E
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3724
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18
3745
17
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3155
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3445
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2940
20
GN
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34 MILS
20°
356 MILS
UTM GRID AND 1964 MAGNETIC NORTH

WELCOME TO WILD HORSE ISLAND

Framed by the shimmering glacial waters of Flathead Lake and the high-rising peaks of the Mission Mountains, Wild Horse Island is a rare image of the peaceful rhythms of nature. Exploration of its inner reaches reveals mature Douglas-fir and Ponderosa Pine forests as well as a last remnant of Montana's native grasslands, the Palouse Prairie. These three ecosystems, in varying stages of succession, provide habitat for more than 100 different birds and mammals, including such species as osprey, bald eagle, Rocky Mountain bighorn sheep, mule deer, coyote, and -- yes -- a few wild horses.

Wild Horse Island became a state park in 1978 through the cooperative efforts of the Bourke MacDonald family,The Nature Conservancy, and the State of Montana. Shortly after the turn of the century, several homesteads were established on the island and, later, attempts to establish permanent resorts were made. In the years prior to its acquisition by the state, however, Mr. MacDonald -- with the help of the Montana Department of Fish, Wildlife & Parks -- managed the area for wildlife and promoted public use. Over time Wild Horse Island has come to hold special meaning for those who have visited its rocky shores to hike, picnic, observe wildlife, swim, fish, or simply enjoy the peace of solitude.

The island, created more than 17,000 years ago during a period of heavy glacial activity, has become a familiar local landmark in the area. The source of the island's name, long shrouded by the cloak of time, originates from a legend that tells us this: Many years before the first white settlers arrived, local Indian tribes used the island to hide valuable steeds from the raids of their enemies. Inevitable, a few remained hidden on the island once the threat was gone. Eventually, white people ventured into the area and the island's name was ensured.

Although the island's original band of wild horses is long gone, its namesake tradition is kept alive through the Bureau of Land Management's "Adopt a Horse" program. Six gelding horses have been acquired in this manner since the island became a state park. Three were released in 1983 and another three in 1992, however, only five remain. Keeping the herd small will protect the native grasses while allowing the island's namesake tradition to go on.

1 or 2
Photos

Photo

PARK ETIQUETTE
Wild Horse Island has been designated a primitive park by the Montana State Legislature. You can help maintain this primitive character by bearing in mind a few simple things.

*If in an area devoid of trails, please spread out. More than 15 steps along the same line in a single year will create a path through previously healthy vegetative cover.
*Exposure to human food can disrupt a wild creature's internal processes and create a dependency that can lead to starvation. PLEASE DO NOT FEED OR APPROACH THE WILDLIFE!
*There are no public restroom facilities in the park. Dispose of human waste in a hole six inches deep and well away from water sources and trails. Cover the hole with soil and pack out all toilet paper.
*Remember--Pack it in, Pack it out. Litter is unsightly and takes away from the experience of those to come later.

Help protect the island from degradation by practicing a no-trace ethic

Please...
Take only memories, Leave only footprints